U.S. Customs and Border Protection

DETAINEE HURRICANE EVACUATION TABLETOP EXERCISE (TTX)

WELCOME

National Weather Service

Hurricane Scenario / Advisories

Module 1 (H-120)

August 30, 2014 (Advisory 1)

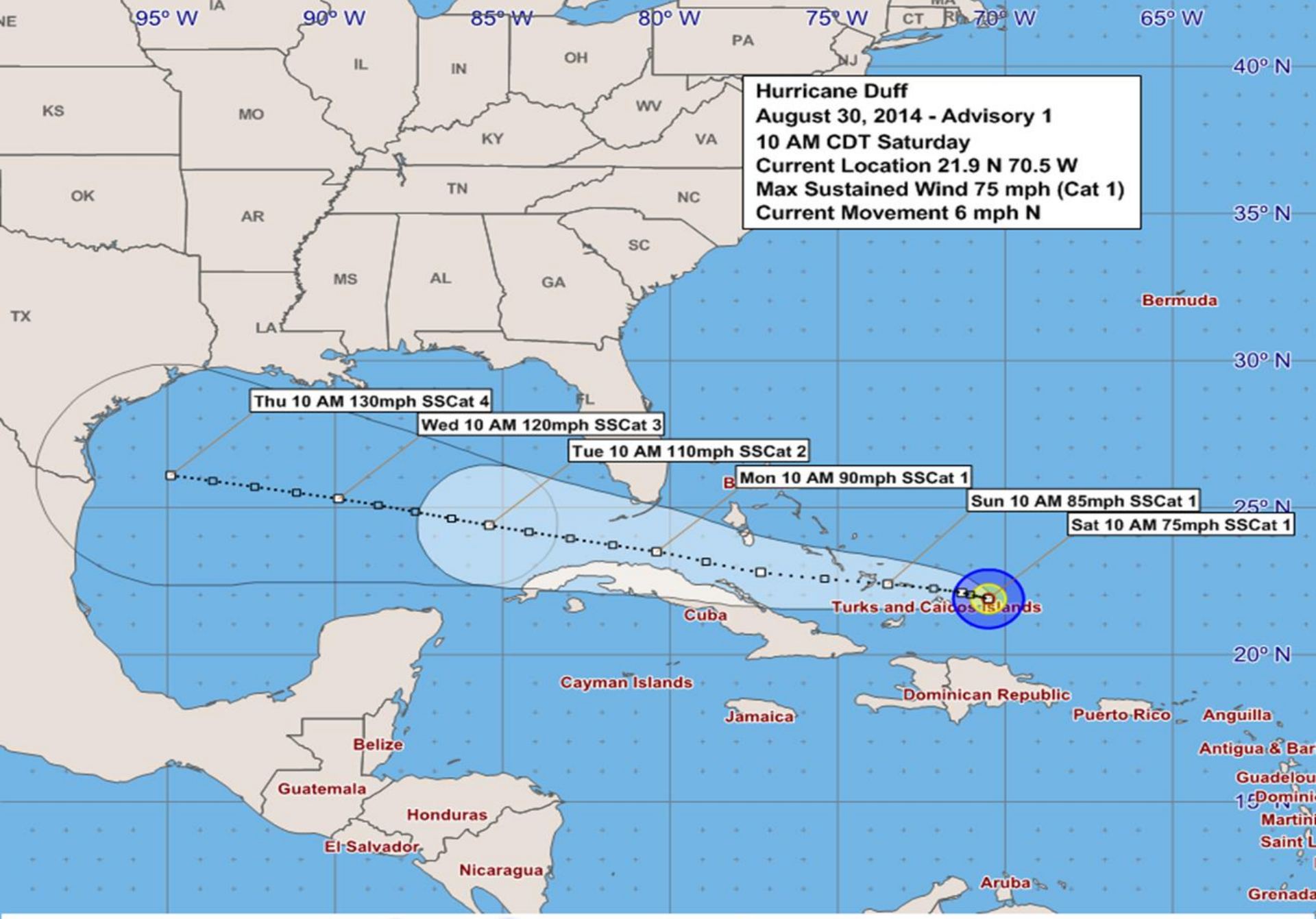
At 10am CDT, the center of Hurricane Duff is located about 1700 miles east-southeast of Brownsville, Texas and moving toward the west-northwest at 6 mph.

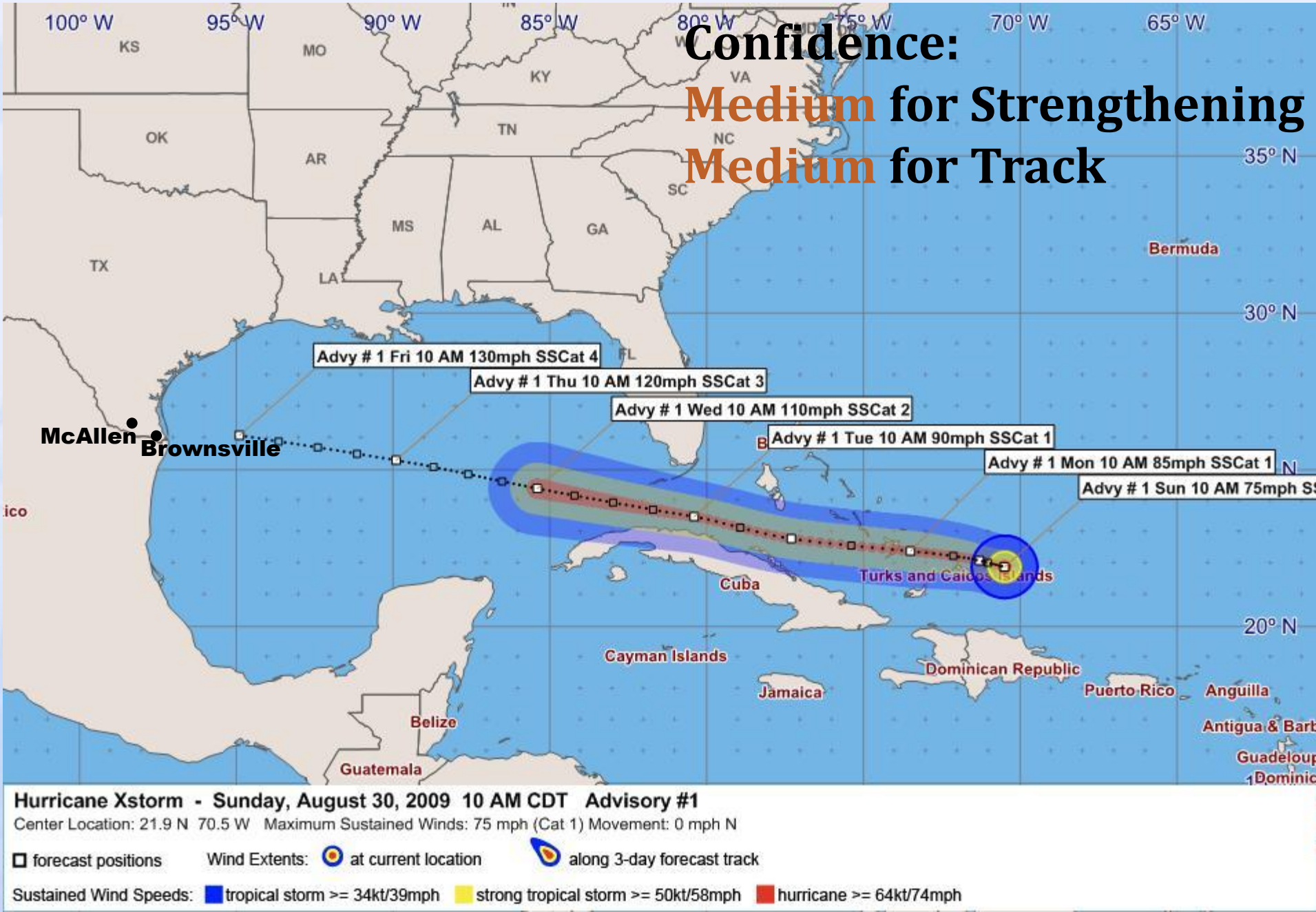
The maximum sustained winds are 75 mph and Duff is a category 1 hurricane on the Saffir-Simpson scale.

Duff is forecast to continue toward the west-northwest for the next few days, passing through the Florida Straits and into the Gulf of Mexico.

The hurricane is forecast to move into an environment of low shear and over warm Gulf water, both of which should allow for consistent strengthening and Duff could be a major hurricane by mid-week.

One uncertainty is what effect interaction with Cuba could have on the structure and eventual intensity of Duff.


Hurricane Duff
August 30, 2014 - Advisory 1
10 AM CDT Saturday
Current Location 21.9 N 70.5 W
Max Sustained Wind 75 mph (Cat 1)
Current Movement 6 mph N
Thu 10 AM 130mph SSCat 4
Wed 10 AM 120mph SSCat 3
Tue 10 AM 110mph SSCat 2
Mon 10 AM 90mph SSCat 1
Sun 10 AM 85mph SSCat 1
Sat 10 AM 75mph SSCat 1
95° W
90° W
85° W
80° W
75° W
70° W
65° W
40° N
35° N
30° N
25° N
20° N
15° N
KS
MO
IL
IN
OH
PA
NJ
CT
WV
KY
VA
NC
TN
OK
AR
SC
MS
AL
GA
FL
LA
TX
Bermuda
Cuba
Turks and Caicos Islands
Cayman Islands
Jamaica
Dominican Republic
Puerto Rico
Anguilla
Belize
Guatemala
Honduras
El Salvador
Nicaragua
Aruba
forecast positions
Potential Track Area: day 1-3 day 4-5
Wind Extents: at current location
Sustained Wind Speeds: tropical storm >= 34kt/39mph
strong tropical storm >= 50kt/58mph
hurricane >= 64kt/74mph

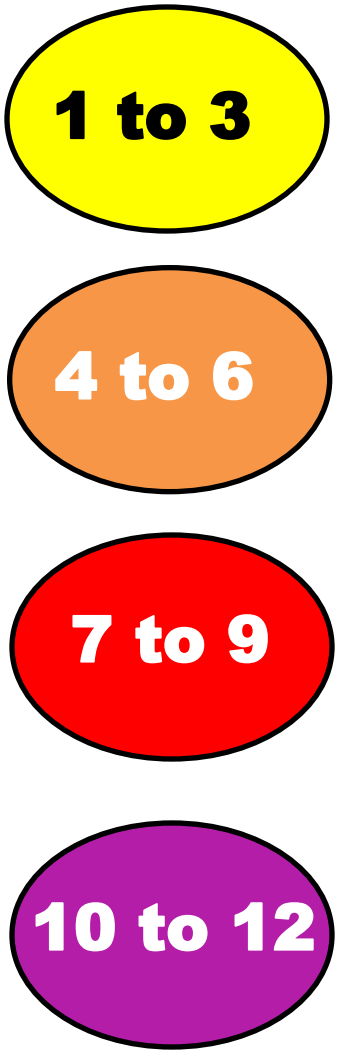

Confidence:
Medium for Strengthening
Medium for Track
100° W
95° W
90° W
85° W
80° W
75° W
70° W
65° W
35° N
30° N
20° N
KS
MO
KY
VA
OK
AR
TN
NC
SC
MS
AL
GA
TX
LA
FL
Bermuda
Advy # 1 Fri 10 AM 130mph SSCat 4
Advy # 1 Thu 10 AM 120mph SSCat 3
Advy # 1 Wed 10 AM 110mph SSCat 2
Advy # 1 Tue 10 AM 90mph SSCat 1
Advy # 1 Mon 10 AM 85mph SSCat 1
Advy # 1 Sun 10 AM 75mph SS
McAllen
Brownsville
Cuba
Turks and Caicos Islands
Cayman Islands
Jamaica
Dominican Republic
Puerto Rico
Anguilla
Antigua & Barb
Belize
Guatemala
Hurricane Xstorm - Sunday, August 30, 2009 10 AM CDT Advisory #1
Center Location: 21.9 N 70.5 W Maximum Sustained Winds: 75 mph (Cat 1) Movement: 0 mph N
forecast positions
Wind Extents:
at current location
along 3-day forecast track
Sustained Wind Speeds:
tropical storm >= 34kt/39mph
strong tropical storm >= 50kt/58mph
hurricane >= 64kt/74mph


0.5
1.7
3.0
4.2
5.4
6.5
7.7
8.9
10.1
11.2
12.4
Steering Pattern, Advisory #1
At ~12,000 Feet
H
H
???
Next 3 Days
Manual Product (editable)
States
Hi Res Topo

TDEM Hurricane Matrix (72 - 120hrs from landfall)

	Winds	Surge	Rainfall/ Flooding	Percentage of the Coast (Disregard for this Exercise)
Low (1)	Tropical Storm (39-73 mph) or Category 1 (74-95 mph) force winds	Minor coastal flooding	Minor flooding in low lying areas	25% of the TX Coastline
Moderate (2)	Category 2 force winds (96-110mph)	Moderate coastal flooding	Moderate flooding and flash flooding	50% of the TX Coastline
High (3)	Category 3 force winds (111-129mph)	Major coastal flooding	Widespread flooding and flash flooding; rivers overflow their banks	75% of the TX Coastline
Extreme (4)	Category 4 (130-156 mph) or 5 (> 157 mph) force winds	Widespread major coastal flooding	Record or near-record flooding; several rivers overflow their banks	100% of the TX Coastline

Threat Ranges/Suggested Actions



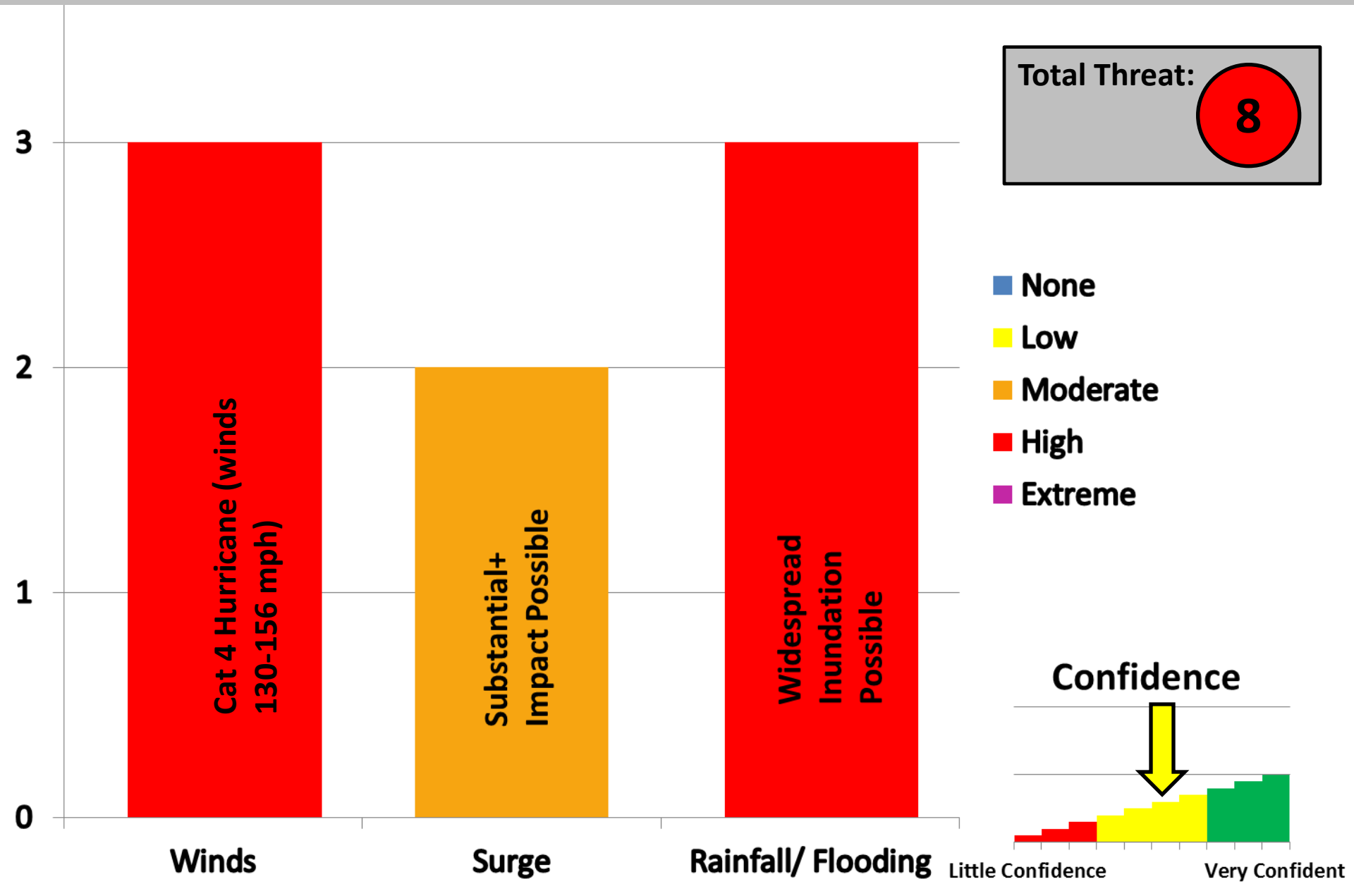
Low. Set up Contingency for Physical and Human Resources

Moderate. Activate Contingency. Ready resources for possible deployment (This will not cost $$)

High. Move resources into position for expected deployment (This will cost $$)

Extreme. Begin deployment (example: AirEvac, Bus movement, PUP/Depot opening and staffing. (This will cost $$)

Threats from Hurricane Duff

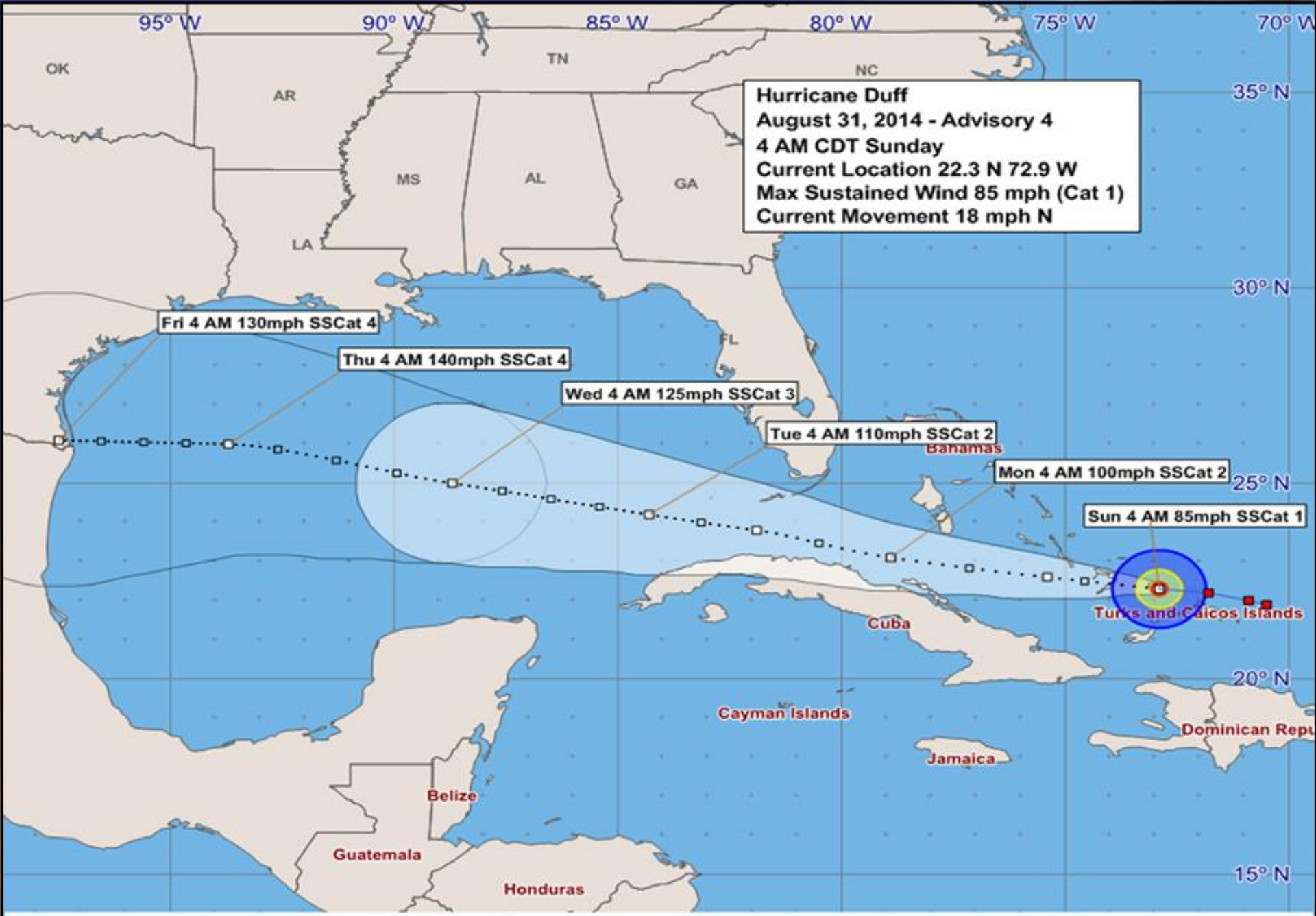


Module 2 (H-96)

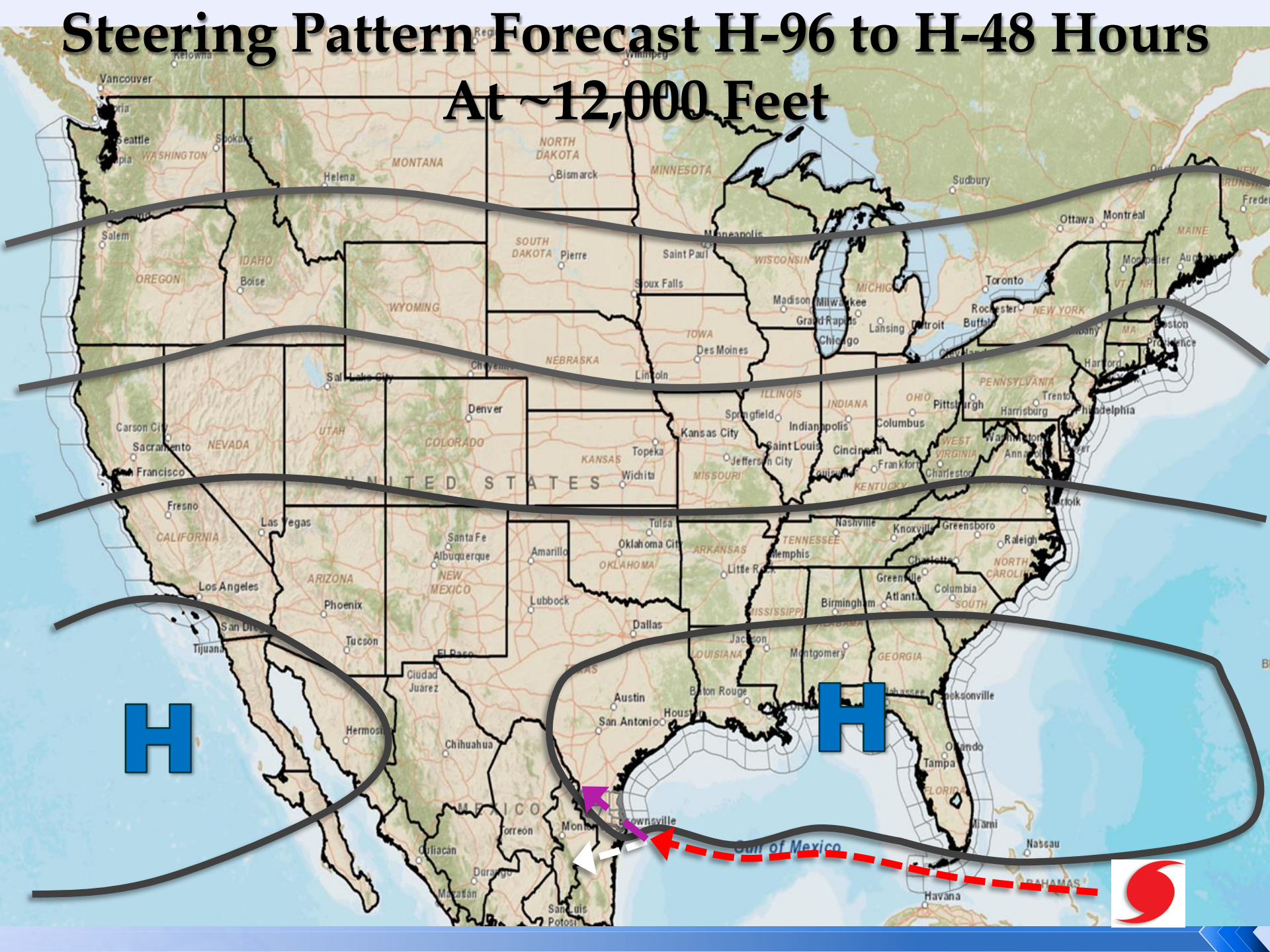
August 31, 2014 (Advisory 4)

At 4 AM CDT, the center of Hurricane Duff is located about 1600 miles east-southeast of Brownsville, Texas and moving toward the west-northwest at 18 mph. Duff is forecast to continue on this heading for the next few days passing through the Florida Straits and into the Gulf of Mexico. The maximum sustained winds are 85 mph and hurricane Duff is forecast to continue to strengthen, possibly becoming a major hurricane in about two days.

Duff is moving along the southern periphery of a strong high pressure area and this is expected to remain in place during the entire forecast across the Gulf of Mexico. There is increasing confidence that Duff will become a major hurricane with the low shear environment. The models are indicating that Duff could also increase in size with its wind field expanding over the next few days. While Duff has yet to pass through the Florida Straits, based on the wind speed probabilities there is already about a 40% chance of experience tropical storm winds somewhere on the Texas coast and almost a 10% chance of Hurricane force.


Hurricane Duff
August 31, 2014 - Advisory 4
4 AM CDT Sunday
Current Location 22.3 N 72.9 W
Max Sustained Wind 85 mph (Cat 1)
Current Movement 18 mph N
Fri 4 AM 130mph SSCat 4
Thu 4 AM 140mph SSCat 4
Wed 4 AM 125mph SSCat 3
Tue 4 AM 110mph SSCat 2
Mon 4 AM 100mph SSCat 2
Sun 4 AM 85mph SSCat 1
95° W
90° W
85° W
80° W
75° W
70° W
35° N
30° N
25° N
20° N
15° N
OK
AR
TN
NC
MS
AL
GA
LA
FL
Bahamas
Cuba
Cayman Islands
Jamaica
Belize
Guatemala
Honduras
Turks and Caicos Islands
Dominican Repu
forecast positions
Potential Track Area:
day 1-3
day 4-5
Wind Extents:
at current location
Sustained Wind Speeds:
tropical storm >= 34kt/39mph
strong tropical storm >= 50kt/58mph
hurricane >= 64kt/74mph

Steering Pattern Forecast H-96 to H-48 Hours At ~12,000 Feet



TDEM Hurricane Matrix (72 - 120hrs from landfall)

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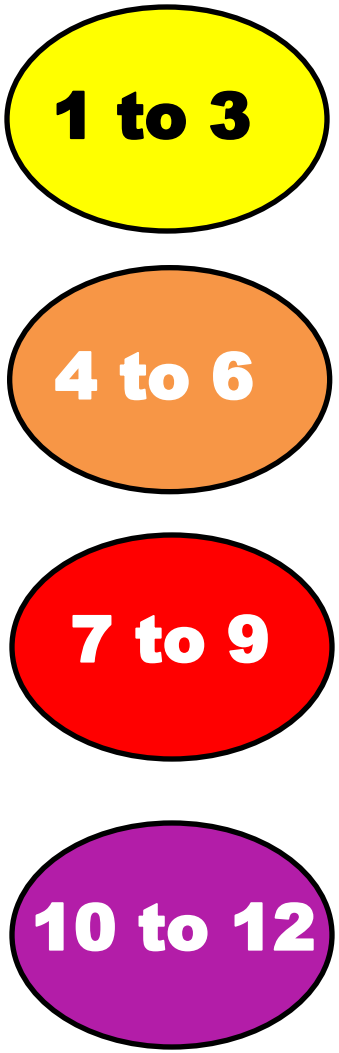
Threat Ranges/Suggested Actions



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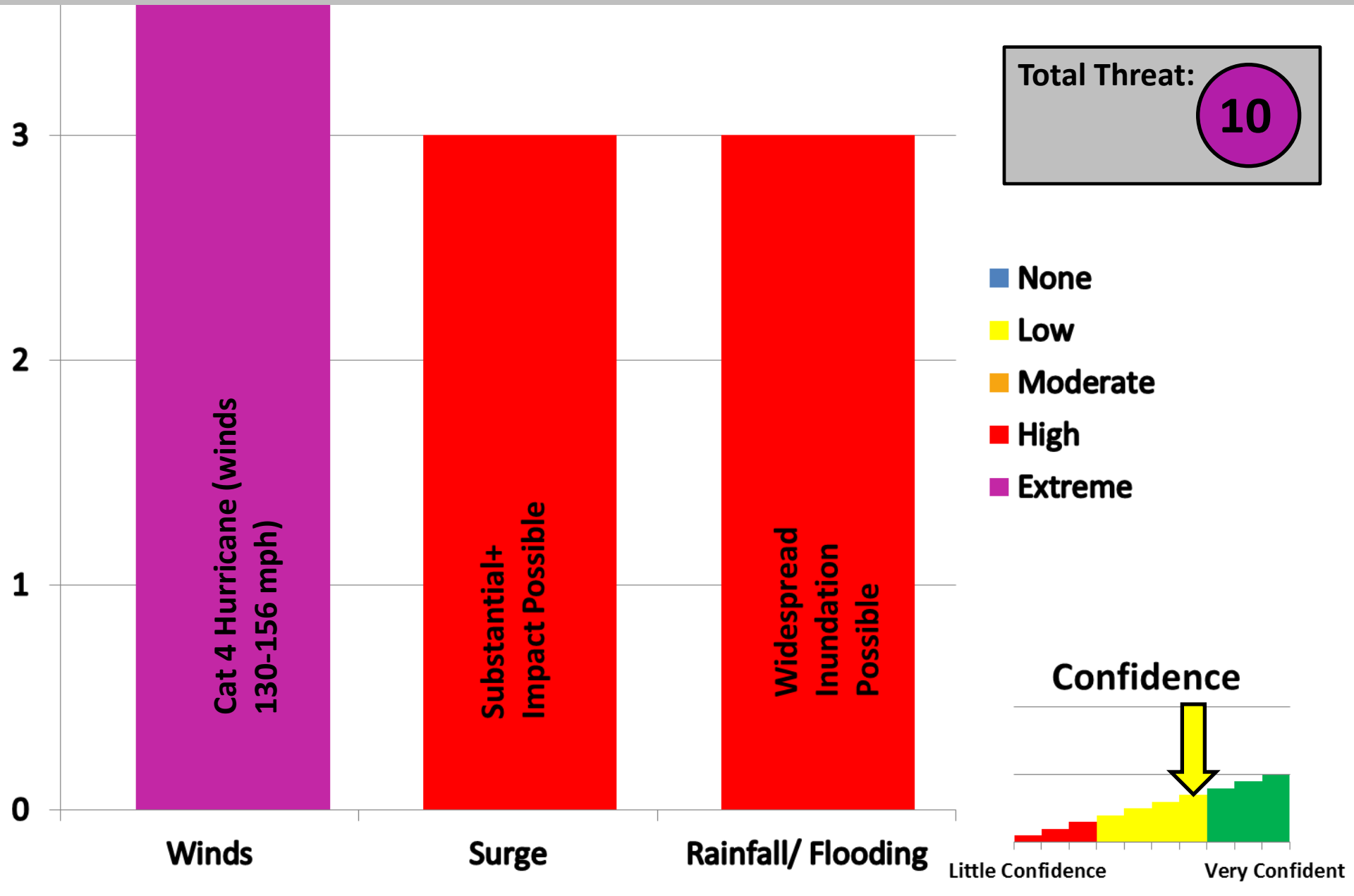
Threats from Hurricane Duff

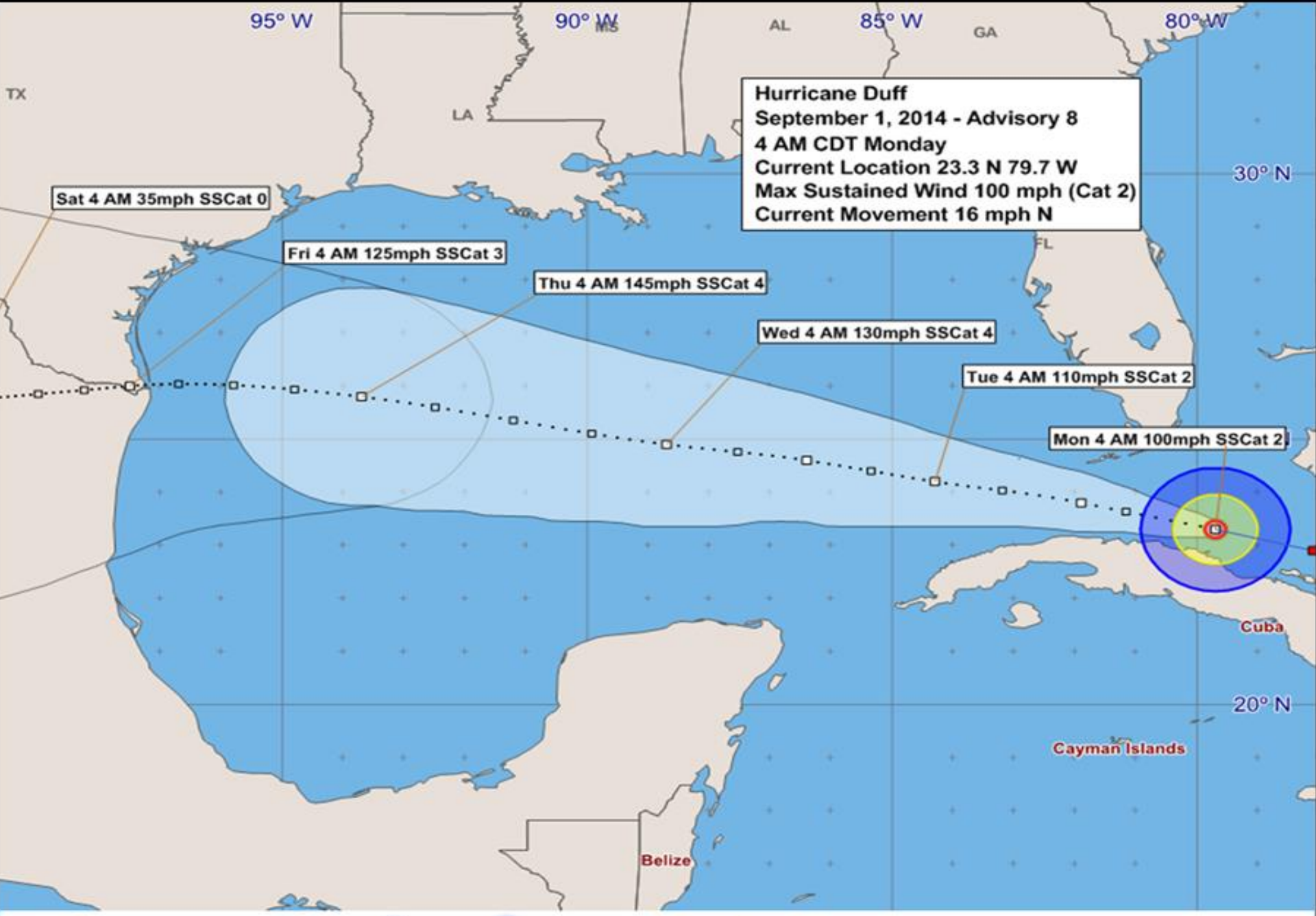


Module 3 (H-72)

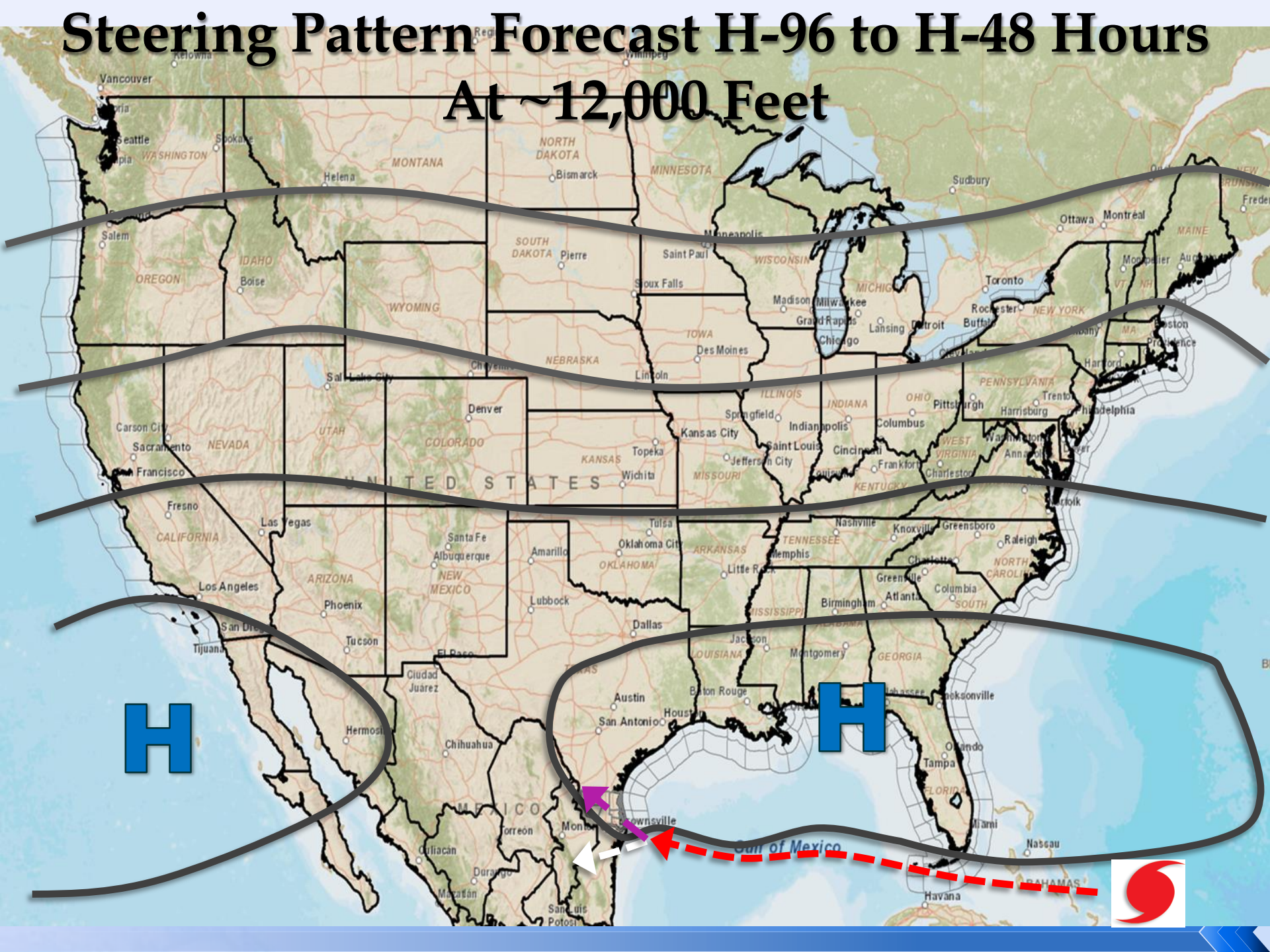
September 1, 2014 (Advisory 8)

At 4 AM CDT, the center of Hurricane Duff is located about 1100 miles east-southeast of Brownsville, Texas and moving toward the west-northwest at 16 mph. The maximum sustained winds are 100 mph and Duff is now a category 2 hurricane. Duff is forecast to continue toward the west-northwest for the next few days as it crosses the Gulf of Mexico. On the current forecast, tropical storm winds could reach the lower Texas coast in about 3 days.

The intensity forecast has become more confident as it appears the structure of Duff won't be disrupted by Cuba as it passes to the north. The combination of a low shear environment and warm waters will mean that Duff should continue to strengthen and could become a major hurricane by tomorrow. With a growing wind field and the persistent pooling of Gulf water, storm surge could begin to affect areas along the Texas coast well in advance of the first tropical storm winds.


95° W
90° W
85° W
80° W
TX
LA
MS
AL
GA
FL
30° N
20° N
Hurricane Duff
September 1, 2014 - Advisory 8
4 AM CDT Monday
Current Location 23.3 N 79.7 W
Max Sustained Wind 100 mph (Cat 2)
Current Movement 16 mph N
Sat 4 AM 35mph SSCat 0
Fri 4 AM 125mph SSCat 3
Thu 4 AM 145mph SSCat 4
Wed 4 AM 130mph SSCat 4
Tue 4 AM 110mph SSCat 2
Mon 4 AM 100mph SSCat 2
Cuba
Cayman Islands
Belize
forecast positions
Potential Track Area:
day 1-3
day 4-5
Wind Extents:
at current location
Sustained Wind Speeds:
tropical storm >= 34kt/39mph
strong tropical storm >= 50kt/58mph
hurricane >= 64kt/74mph

Steering Pattern Forecast H-96 to H-48 Hours At ~12,000 Feet



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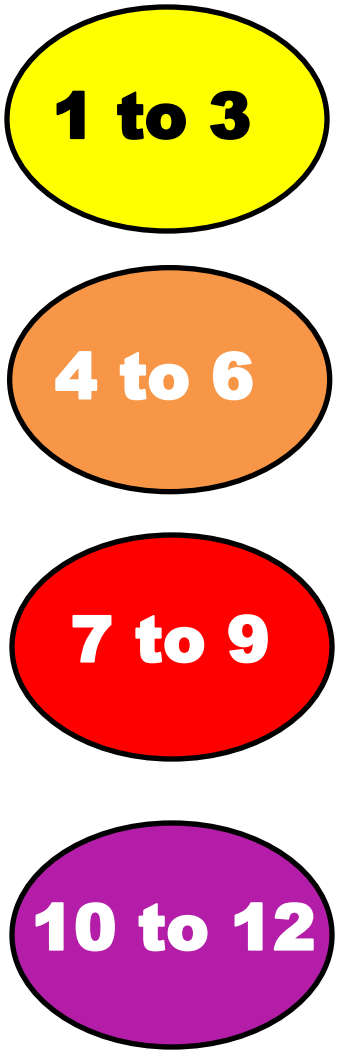

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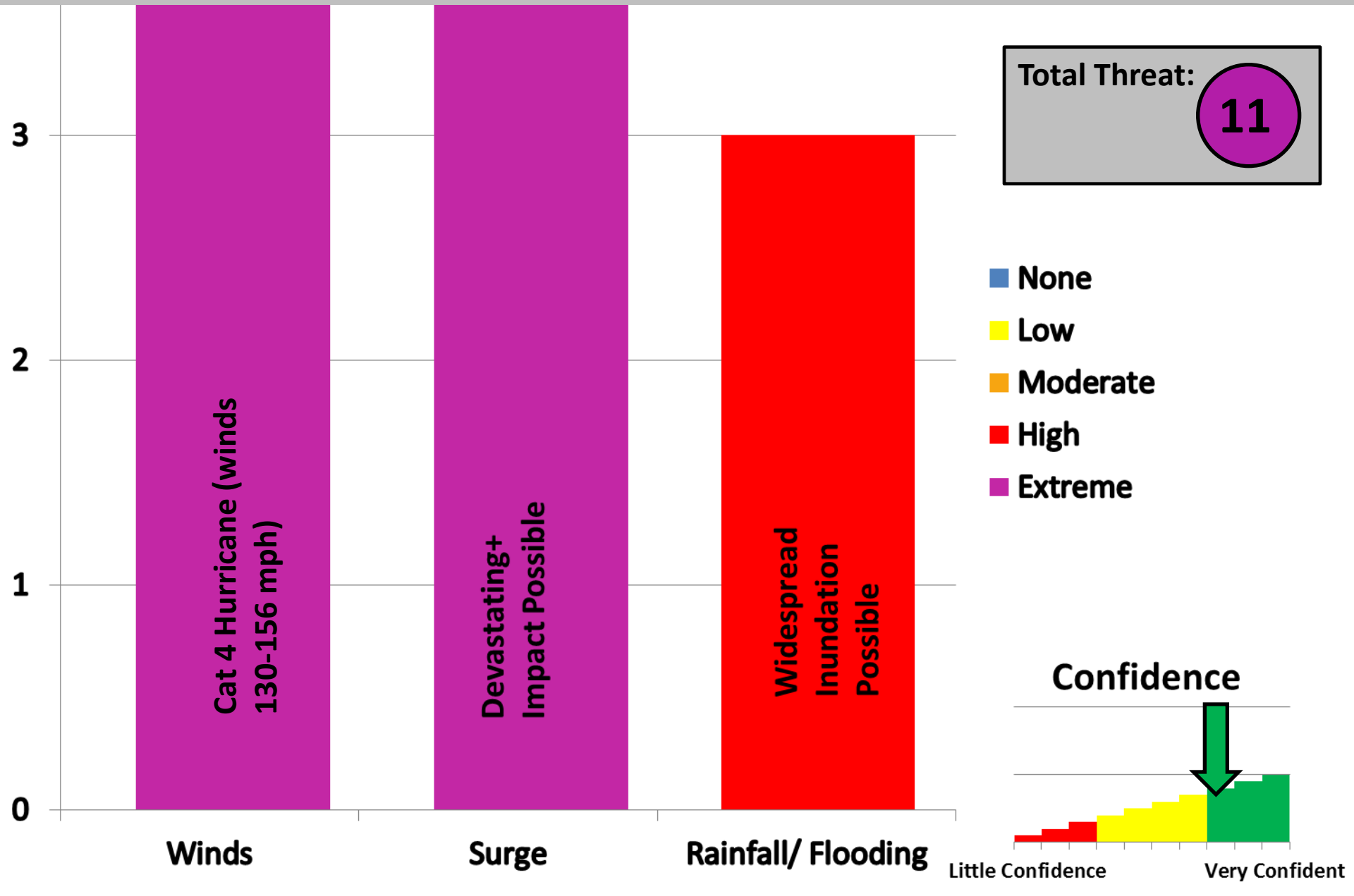
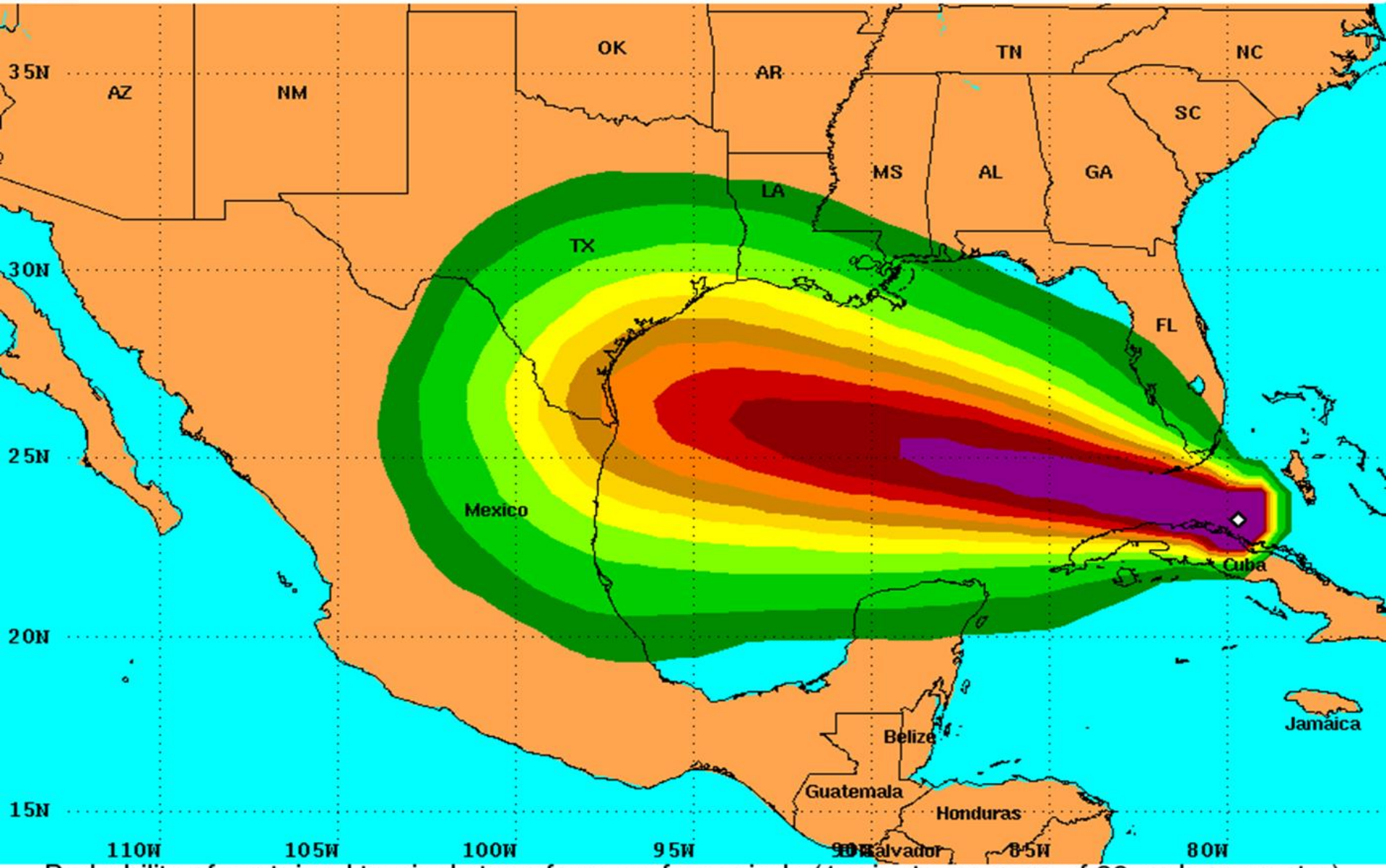
Threats from Hurricane Duff



PRELIMINARY (SINGLE STORM) Tropical Storm Force Wind Speed Probabilities

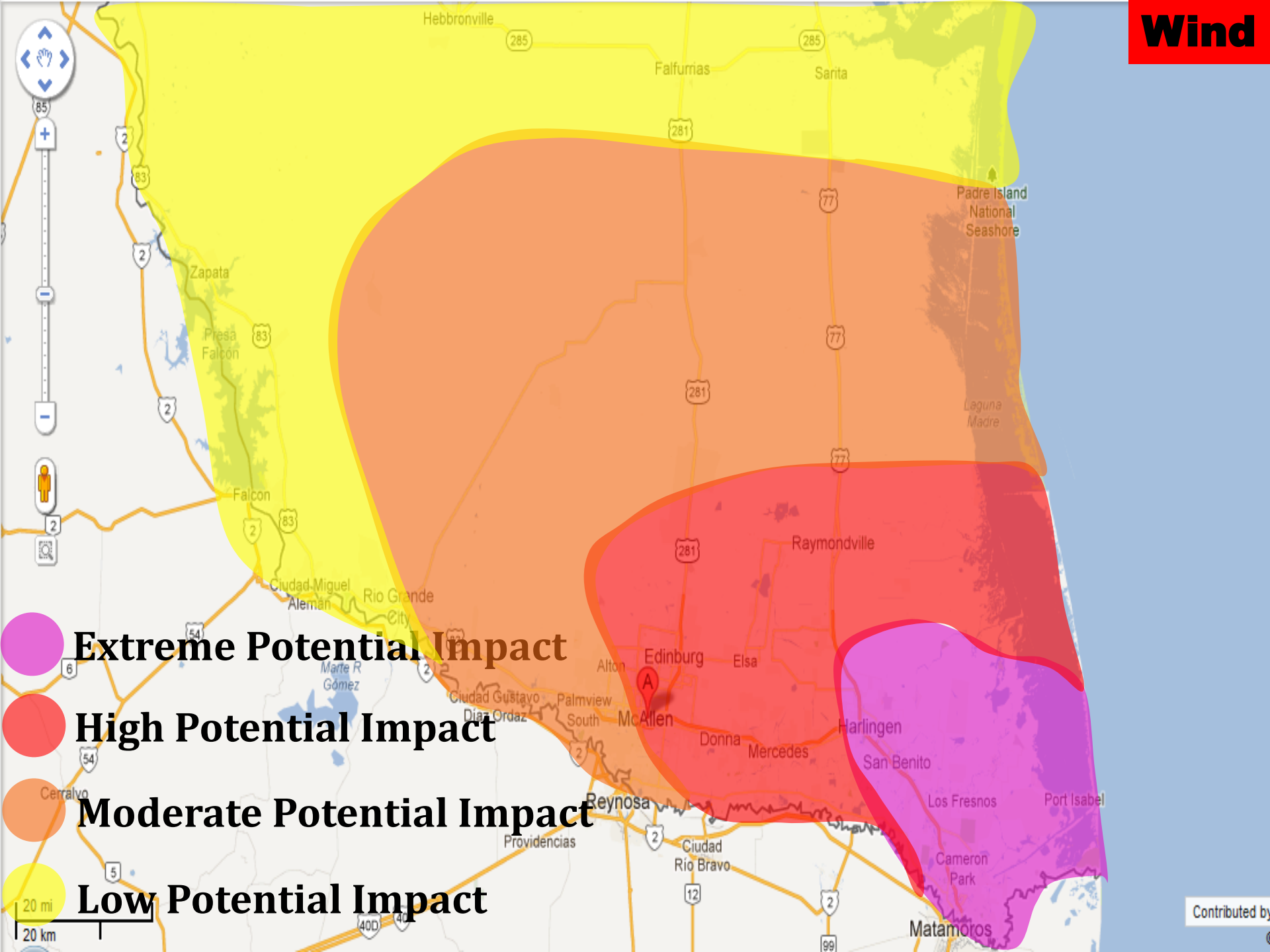
For the 120 hours (5 days) from 2 AM EDT Mon Sep 1 to 2 AM EDT Sat Sep 6



Probability of sustained tropical storm force surface winds (1-minute average of 39 mph or greater)

◇ indicates HURRICANE DUFF center location at 2 AM EDT Mon Sep 1 2014 (Forecast/Advisory #8)

5% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%


Wind
Extreme Potential Impact
High Potential Impact
Moderate Potential Impact
Low Potential Impact
Hebbronville
Falfurrias
Sarita
Padre Island National Seashore
Zapata
Presa Falcón
Falcon
Laguna Madre
Raymondville
Ciudad Miguel Alemán
Rio Grande City
Alton
Edinburg
Elsa
Ciudad Gustavo Díaz Ordaz
Palmview South
McAllen
Donna
Mercedes
Harlingen
San Benito
Los Fresnos
Port Isabel
Cerralvo
Reynosa
Providencias
Ciudad Río Bravo
Cameron Park
Matamoros
20 mi
20 km
Contributed by

Impact Levels	Wind – Potential Impact Descriptions
Cameron and Willacy County, Along/East of Highway 77	**Potential for Extreme Impact:** Extremely dangerous and life-threatening winds may occur. Aggressive preparations should be made for the threat of devastating to catastrophic wind damage. **Devastating Damage** – If realized, all older mobile homes will be destroyed. Houses of poor to average construction will be destroyed or severely damaged. Moderate to major damage of well-constructed houses will include up to one half of all gabled roofs. Also, a significant number of exterior walls will fail. Aluminum and light weight steel roofs will be torn off buildings at industrial parks. Partial roof and exterior wall failure are likely at low rise apartment buildings, especially those of poor to average construction. Most windows in tall buildings will be blown out, with other minor to moderate damage possible due to swaying. Airborne debris of light to moderate weight will cause additional major damage, as well as injuries and possible loss of life. Near total power loss is expected. Many power poles will be knocked down, and numerous transformers will pop. Outages will last for weeks in some areas. The availability of potable water will be diminished as filtration systems begin to fail. Thousands of trees will be severely damaged. Up to three quarters of all healthy small to medium sized trees will snap or uproot, especially on saturated ground. Severe damage is expected to citrus orchards; some orchards may face total destruction. Most newly planted ground crops will be wiped out. Livestock left to weather the storm will be injured, some critically. Some livestock deaths are likely.
Extreme	Descriptions are consistent with sustained hurricane force winds or frequent gusts of Category 3 intensity (111 to 130 mph) as realized in hardest hit places. **Catastrophic Damage** – If realized, damage will be unprecedented. Much of the affected area will be uninhabitable for weeks, perhaps longer in spots. At least one half of well-constructed homes will have roof and wall failure. All gabled roofs will fail, and most of those homes will be destroyed. The majority of industrial buildings will become non-functional; partial to complete wall and roof damage is likely. All wood framed low rising apartment buildings will be destroyed. Concrete block or brick low rise apartments will have major damage, including some wall and roof failure. Tall buildings will sway dangerously and have most windows blown out; a few may collapse. Airborne debris will be widespread and include heavy items such as household appliances and even some light automobiles. Sport utility vehicles and light trucks will be moved or tossed. The blown debris will create

High — McAllen, Edinburg, Mercedes, Pharr, Weslaco/Donna

Potential for High Impact: Dangerous and life-threatening winds may occur. Aggressive preparations should be made for the threat of major wind damage. If realized, the majority of older mobile homes will be severely damaged or destroyed. Those that remain will be uninhabitable until repaired. Houses of poor to average construction will have major damage including partial wall collapse and roofs being lifted off. Many will be uninhabitable until repaired. Well-constructed houses will have minor to moderate damage to shingles, siding, and gutters. Many unprotected and exposed windows will be blown out. Partial roof failure is expected in industrial parks, especially to those buildings with light weight steel and aluminum coverings. Older low-rising apartment roofs may also be torn off, as well as siding and shingle damage. Airborne debris will cause damage, injury, and possible death. Power outages will be widespread, and could continue for multiple weeks in some areas. Numerous power lines will be pulled down, and a number of power poles will fall.

All trees with rotting bases will uproot or snap. Nearly all large healthy branches will snap. Some healthy trees will uproot, especially where ground is saturated. Major damage is expected to citrus orchards. Most newly planted crops will be damaged.

Descriptions are consistent with sustained hurricane force winds or frequent gusts of Category 2 intensity (96 to 110 mph) as realized in hardest hit places.

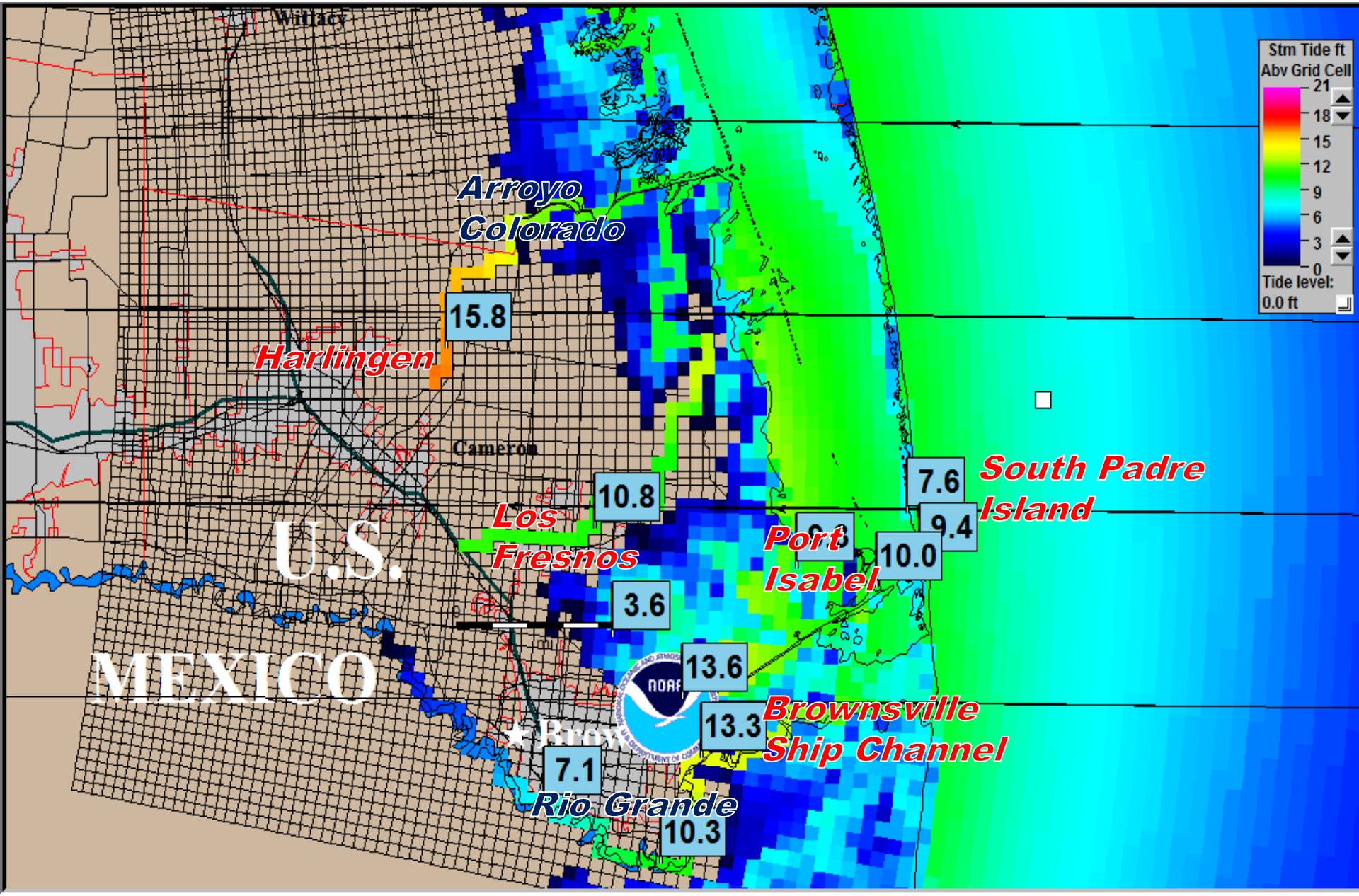
Moderate — La Joya, Sullivan City, La Grulla, Rio Grande City

Potential for Moderate Impact: Preparations should be made for the threat of moderate wind damage. If realized, most mobile homes will experience moderate to substantial damage; those of poor construction will be destroyed. Houses of poor to average construction will have significant damage to shingles, siding, and gutters; more serious structural damage is possible. Unprotected and exposed windows are at risk of being blown out. Many screened patios will be damaged. Some well-constructed homes will also see shingle and siding damage. Unfastened light to moderate weight items will become airborne, causing additional damage and possible injury. Hundreds of power lines will be blown down; local outages will affect entire neighborhoods.

Many large branches of healthy trees will be snapped, and rotting small to medium sized trees will be uprooted. Numerous palm fronds will be blown down, and minor to moderate damage will occur to citrus orchards and newly planted lowland crops.

Descriptions are consistent with sustained hurricane force winds or frequent gusts of Category 1 intensity (74 to 95 mph) as realized in hardest hit places.

Potential Inundation, Duff (First Guess)



Duff - Potential Flooding from the Sea

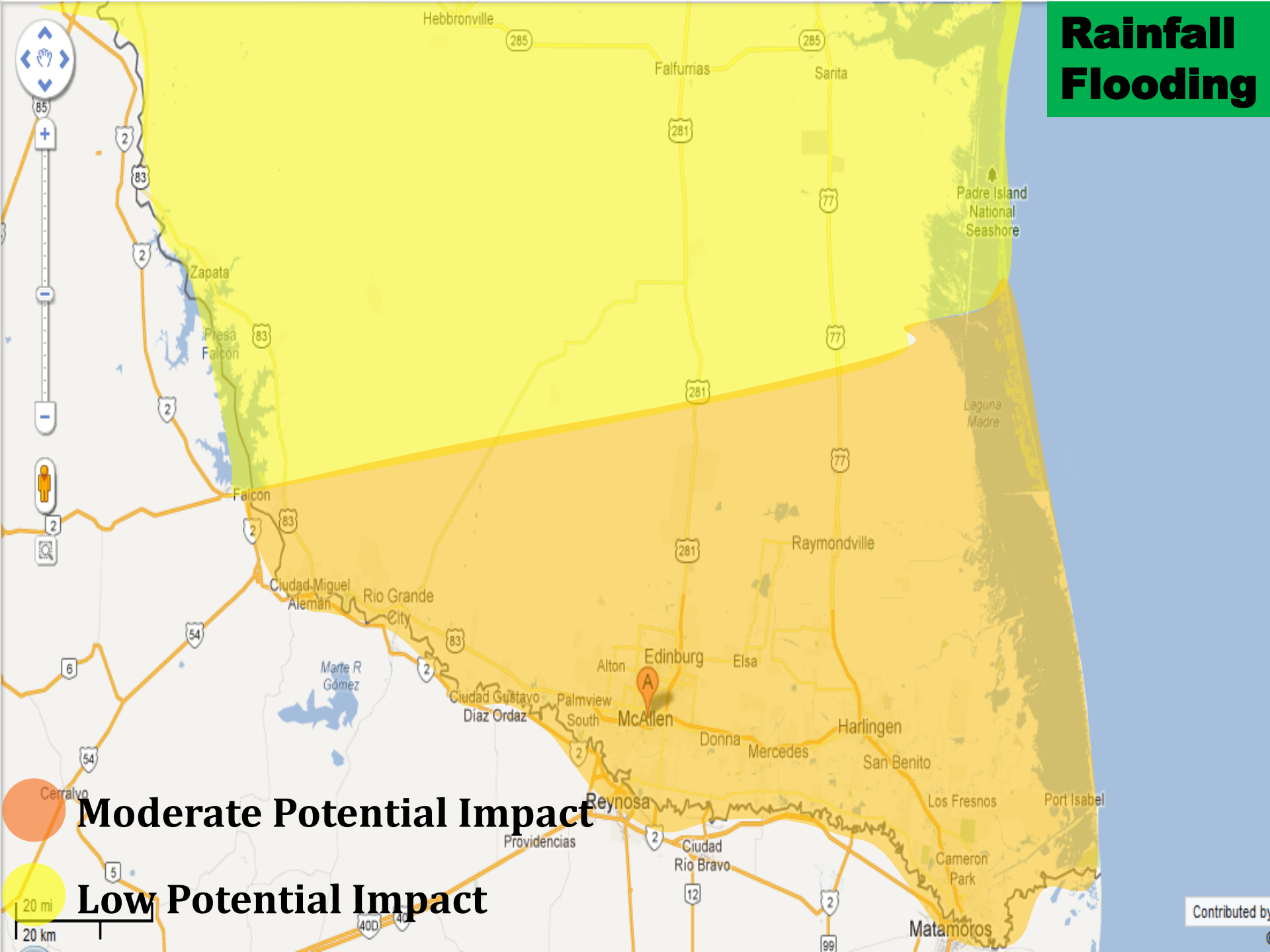
your emergency action plan)

Extreme

Potential for Extreme Impact: Extremely dangerous and life-threatening inundation may occur. Aggressive preparations should be made for the threat of catastrophic coastal flood damage from sea water. If realized, coastal cities and towns will be inundated, perhaps entirely. Within mandatory evacuation areas, persons who fail to leave will be swept to their deaths, as will outdoor animals and livestock. Some beaches will be destroyed beyond recognition and new inland cuts will be created. Hundreds of structures will be significantly flooded or washed away. Condominiums and hotels will also be devastated, some to the point of collapse. Damage will be accentuated by considerable floating debris. Extensive damage is expected to marinas, docks, and piers. Numerous small craft will break away from their moorings.

Vehicles left behind within evacuation areas will be swept away. Dozens, if not hundreds, of roads will be overspread or washed away; full recovery will take months, if not years. Sea water many feet in depth may reach more than a mile inland. Flood conditions will be worsened by intense battering waves on top of storm surge and tide. Such waves will exacerbate property damage and wash out solid road and bridge structures. Damage from beach erosion will take years to restore.

Descriptions are consistent with the likelihood for widespread inundation with local water depths greater than 7 feet (above ground level) in hardest hit places. Relative to impact potential, coastal flooding may be historic since there are no recent comparable events which have occurred along or near the coast of the Lower Rio Grande Valley.


Rainfall Flooding
Moderate Potential Impact
Low Potential Impact
Hebbronville
Falfurrias
Sarita
Padre Island National Seashore
Zapata
Presa Falcón
Falcon
Laguna Madre
Raymondville
Ciudad Miguel Alemán
Rio Grande City
Marte R Gómez
Alton
Edinburg
Elsa
McAllen
Ciudad Gustavo Díaz Ordaz
Palmview South
Donna
Mercedes
Harlingen
San Benito
Los Fresnos
Port Isabel
Cerralvo
Reynosa
Providencias
Ciudad Río Bravo
Cameron Park
Matamoros
20 mi
20 km
Contributed by

Duff - Potential Rainfall Flooding

Moderate

Potential for Moderate Impact: Residents should prepare for areas of flooding, especially in poor drainage locations. If realized, minor to moderate property damage will occur and several main thoroughfares may be closed. Known intersections with very poor drainage may experience 2 to 4 feet of flood water. Other poor drainage areas may have flood water depth up to 2 feet. Most small streams and arroyos will approach, or possibly exceed, bankfull.

Descriptions are consistent with a significant threat to life and property and the likelihood for rain totals to exceed flash flood thresholds.

Low

Potential for Low but Concerning Impact: Residents should prepare for areas of nuisance flooding along with isolated minor flooding. Some ponding will occur elsewhere. Known roadway intersections having very poor drainage may temporarily experience 1 to 2 feet of flood water. Other poor drainage areas will have flood water depth up to 1 foot.

Descriptions are consistent with an elevated threat to life and property and the likelihood for higher rain totals to approach flash flood thresholds.

NWS Key Points
(ADVISORY 8)

- Confidence has increased on potential for devastating damage for parts of Rio Grande Valley
- Destructive Winds, Potential for Demolition of Poorly Built Structures Along/East of US 77
- ***Storm Surge***: Potential for 1933 or Worse Event
  - 13+ feet of water depth in some areas possible
  - Exact location of highest surge cannot be pinpointed this far out, nor can tide addition or subtraction
  - Surge will begin impacting SPI and Port Isabel 24-36 hours ahead of "H" time with some neighborhoods potentially getting cut off
- ***Rainfall Flooding*** will be problem in poor drainage areas; too early to tell coverage and intensity
- Not expecting significant post-event Rio Grande flooding
  - No Alex or Gilbert; Reservoirs can handle water inflows

Module 4 (Scenario #2)

July 26, 2000 (Xena Advisories)

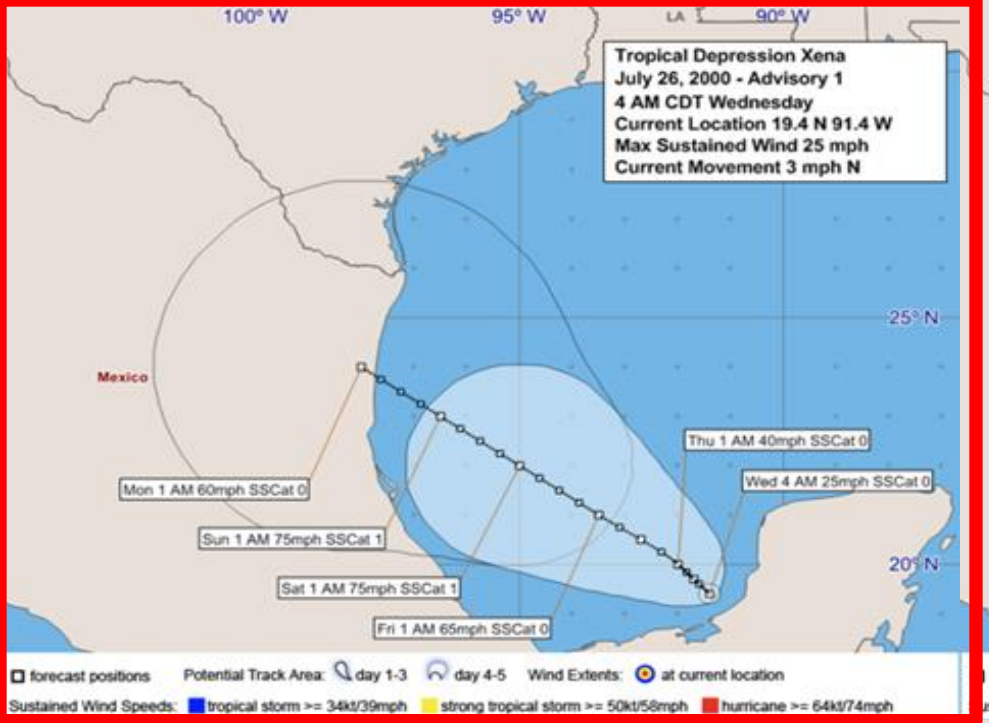
Tropical Depression Xena forms in the Bay of Campeche on the morning of July 26. The initial forecast has slow development with a forecast that keeps all of the hazards south of Texas.

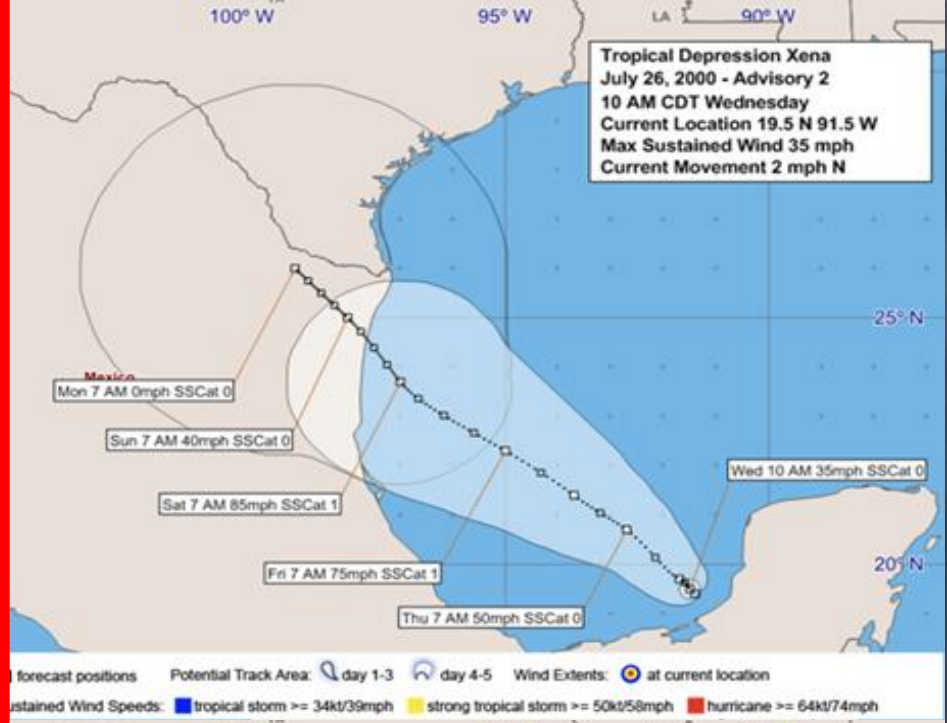
Six hours later the forecast shifts northward with Xena reaching the upper Mexican coast as a Hurricane with Tropical Storm force winds arriving at BRO in about H-72 hrs.

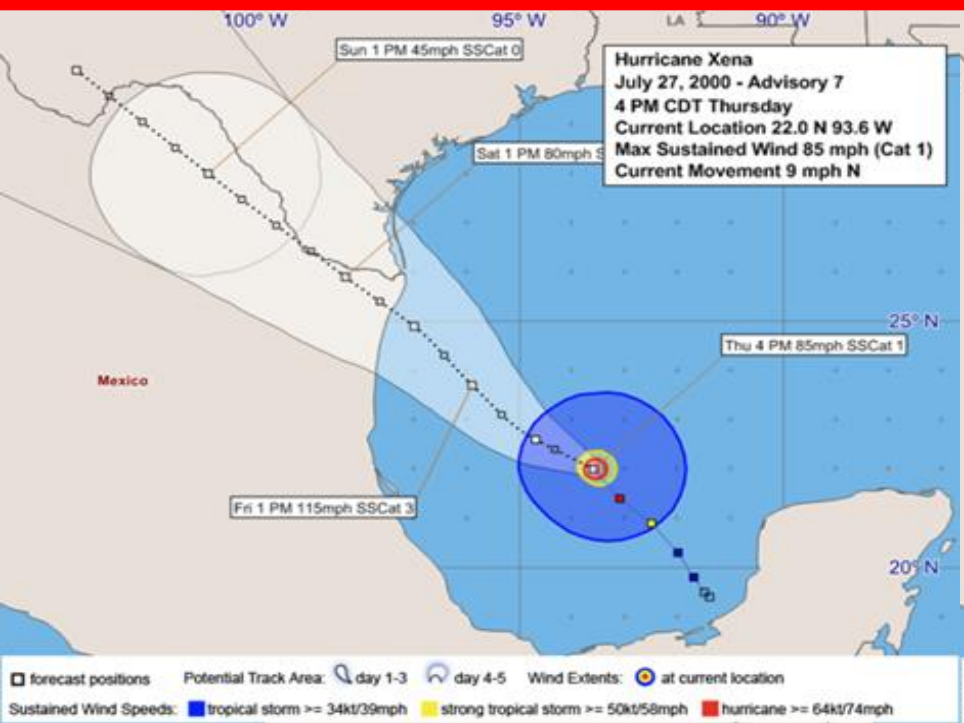
Another six hours later (4pm July 26) Tropical Storm Xena is forecast to strengthen more and the Tropical Storm force winds arrival is faster, now at H-48 hrs.

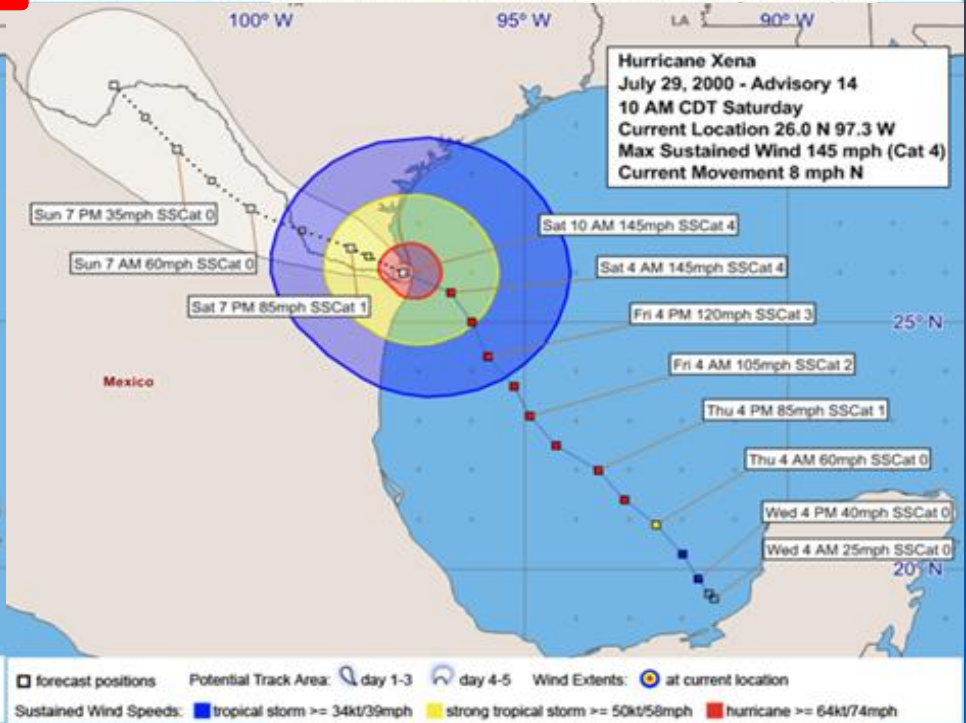
By 4pm on July 27, Hurricane Xena is forecast to be a Category 3 hurricane when it reaches the coast just south of the Mexico/US border. The onset time of Tropical Storm force winds is now H-36 hrs.

Xena makes landfall at Brownsville as a Category 4 Hurricane on the morning of July 29. Xena forms and makes landfall in just under H-80 hrs.


Tropical Depression Xena
July 26, 2000 - Advisory 1
4 AM CDT Wednesday
Current Location 19.4 N 91.4 W
Max Sustained Wind 25 mph
Current Movement 3 mph N
100° W
95° W
90° W
LA
25° N
20° N
Mexico
Mon 1 AM 60mph SSCat 0
Sun 1 AM 75mph SSCat 1
Sat 1 AM 75mph SSCat 1
Fri 1 AM 65mph SSCat 0
Thu 1 AM 40mph SSCat 0
Wed 4 AM 25mph SSCat 0
forecast positions
Potential Track Area: day 1-3 day 4-5
Wind Extents: at current location
Sustained Wind Speeds: tropical storm >= 34kt/39mph
strong tropical storm >= 50kt/58mph
hurricane >= 64kt/74mph

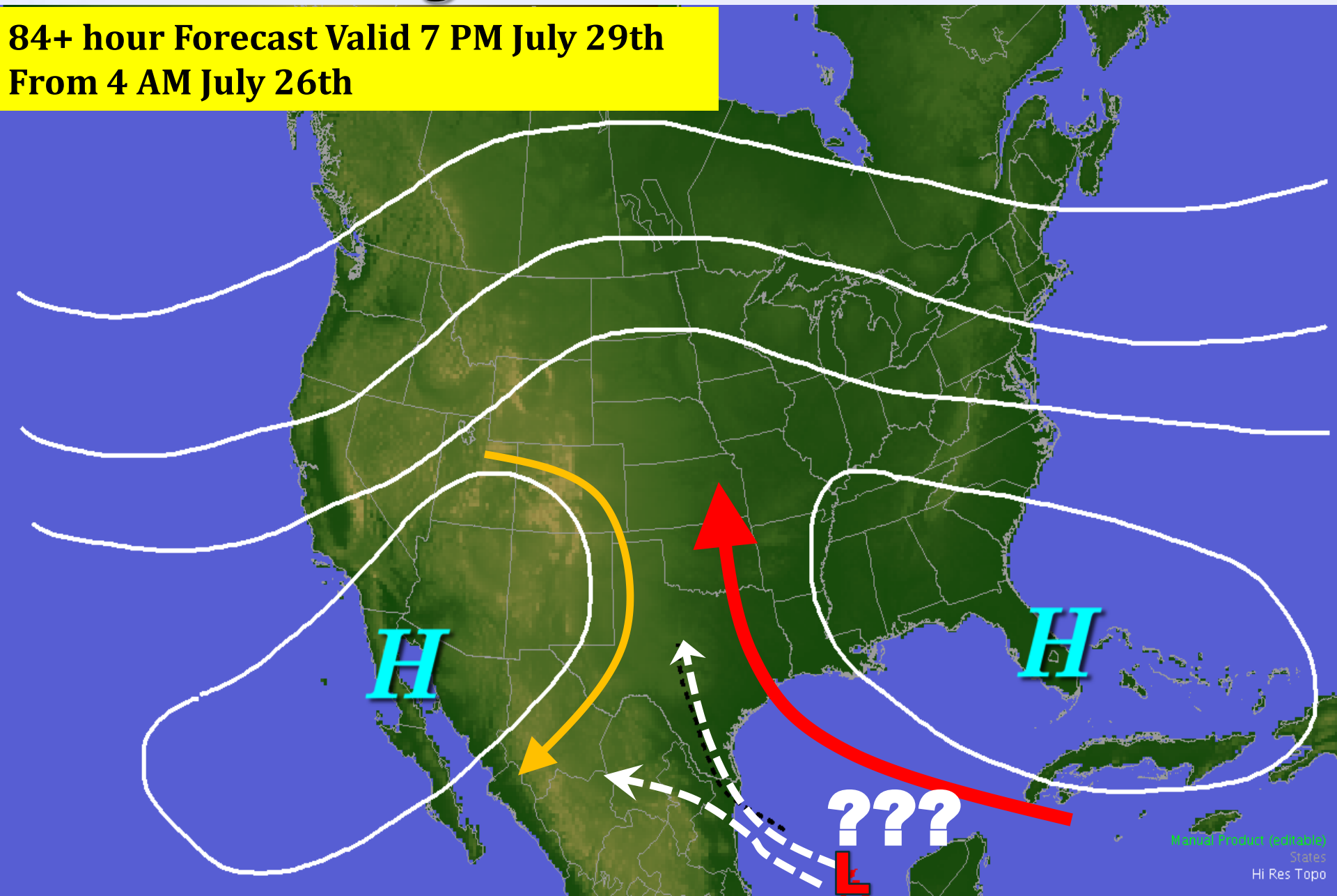

Tropical Depression Xena
July 26, 2000 - Advisory 2
10 AM CDT Wednesday
Current Location 19.5 N 91.5 W
Max Sustained Wind 35 mph
Current Movement 2 mph N
100° W
95° W
90° W
LA
25° N
20° N
Mexico
Mon 7 AM 0mph SSCat 0
Sun 7 AM 40mph SSCat 0
Sat 7 AM 85mph SSCat 1
Fri 7 AM 75mph SSCat 1
Thu 7 AM 50mph SSCat 0
Wed 10 AM 35mph SSCat 0
forecast positions
Potential Track Area: day 1-3 day 4-5
Wind Extents: at current location
Sustained Wind Speeds: tropical storm >= 34kt/39mph
strong tropical storm >= 50kt/58mph
hurricane >= 64kt/74mph


Hurricane Xena
July 27, 2000 - Advisory 7
4 PM CDT Thursday
Current Location 22.0 N 93.6 W
Max Sustained Wind 85 mph (Cat 1)
Current Movement 9 mph N
100° W
95° W
90° W
LA
25° N
20° N
Mexico
Sun 1 PM 45mph SSCat 0
Fri 1 PM 115mph SSCat 3
Thu 4 PM 85mph SSCat 1
forecast positions
Potential Track Area: day 1-3 day 4-5
Wind Extents: at current location
Sustained Wind Speeds: tropical storm >= 34kt/39mph
strong tropical storm >= 50kt/58mph
hurricane >= 64kt/74mph

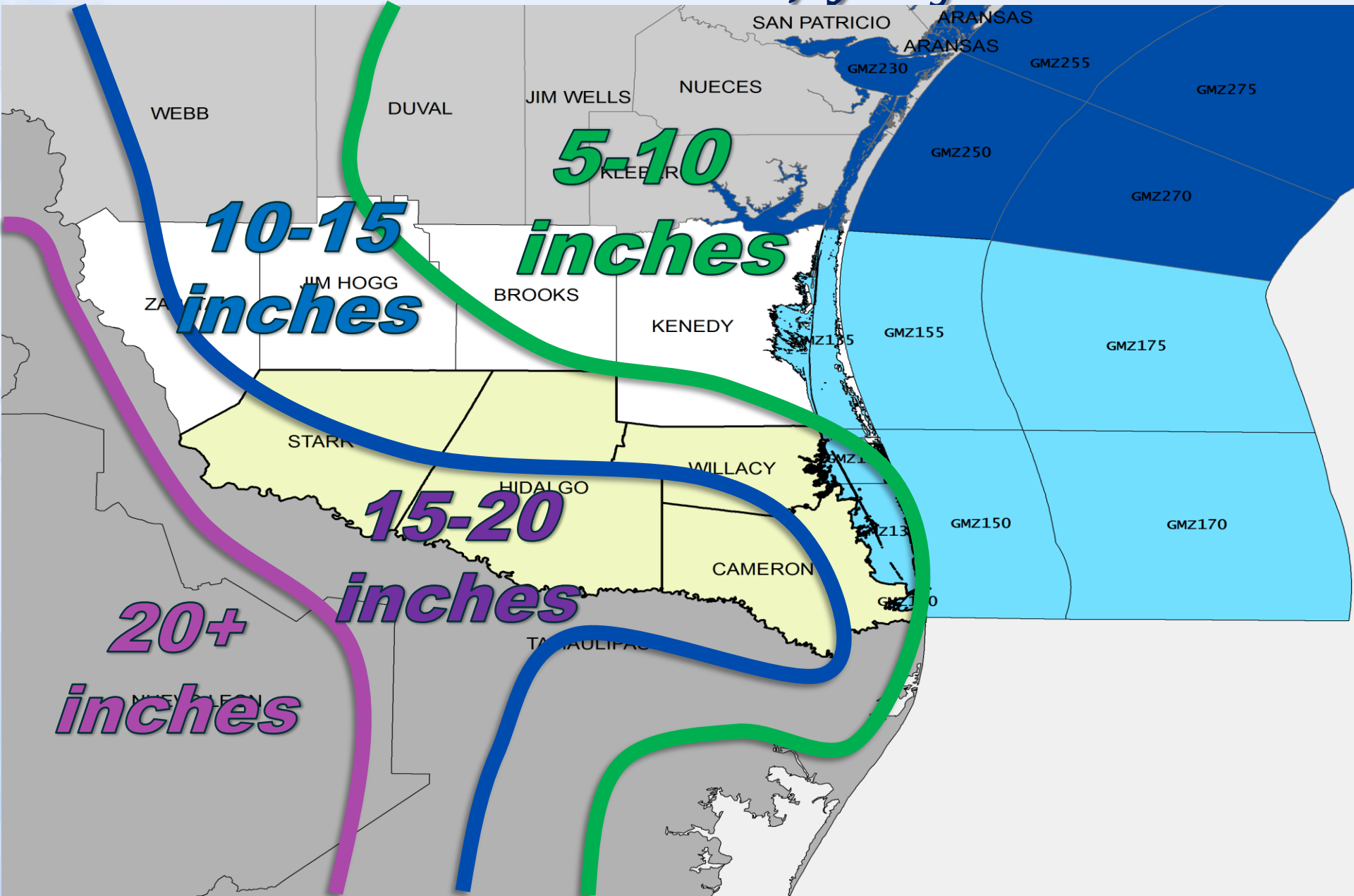

Hurricane Xena
July 29, 2000 - Advisory 14
10 AM CDT Saturday
Current Location 26.0 N 97.3 W
Max Sustained Wind 145 mph (Cat 4)
Current Movement 8 mph N
100° W
95° W
90° W
LA
25° N
20° N
Mexico
Sun 7 PM 35mph SSCat 0
Sun 7 AM 60mph SSCat 0
Sat 7 PM 85mph SSCat 1
Sat 10 AM 145mph SSCat 4
Sat 4 AM 145mph SSCat 4
Fri 4 PM 120mph SSCat 3
Fri 4 AM 105mph SSCat 2
Thu 4 PM 85mph SSCat 1
Thu 4 AM 60mph SSCat 0
Wed 4 PM 40mph SSCat 0
Wed 4 AM 25mph SSCat 0
forecast positions
Potential Track Area: day 1-3 day 4-5
Wind Extents: at current location
Sustained Wind Speeds: tropical storm >= 34kt/39mph
strong tropical storm >= 50kt/58mph
hurricane >= 64kt/74mph

Steering Winds at 12,000 Feet

84+ hour Forecast Valid 7 PM July 29th
From 4 AM July 26th



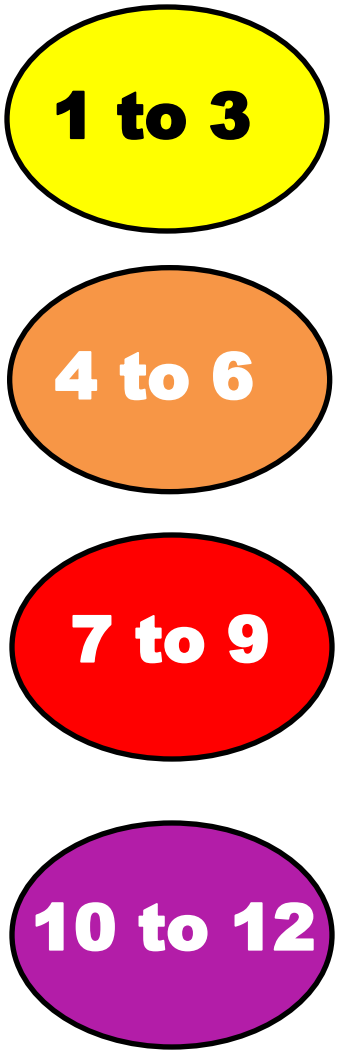
Previous Rainfall, July 16-23



TDEM Hurricane Matrix (72 - 120hrs from landfall)

	Winds	Surge	Rainfall/ Flooding	Percentage of the Coast (Disregard for this Exercise)
Low (1)	Tropical Storm (39-73 mph) or Category 1 (74-95 mph) force winds	Minor coastal flooding	Minor flooding in low lying areas	25% of the TX Coastline
Moderate (2)	Category 2 force winds (96-110mph)	Moderate coastal flooding	Moderate flooding and flash flooding	50% of the TX Coastline
High (3)	Category 3 force winds (111-129mph)	Major coastal flooding	Widespread flooding and flash flooding; rivers overflow their banks	75% of the TX Coastline
Extreme (4)	Category 4 (130-156 mph) or 5 (> 157 mph) force winds	Widespread major coastal flooding	Record or near-record flooding; several rivers overflow their banks	100% of the TX Coastline

Threat Ranges/Suggested Actions



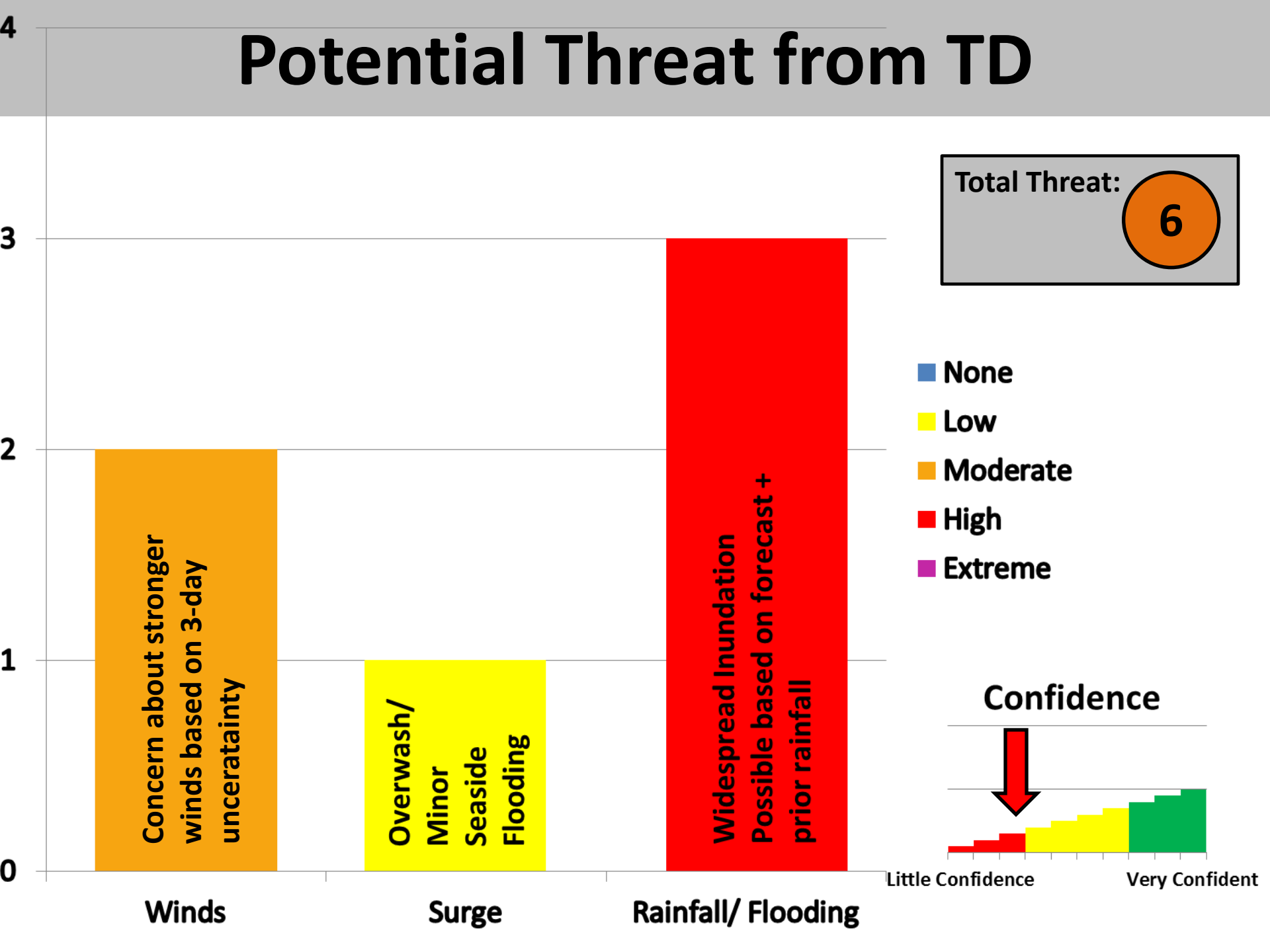
Low. Set up Contingency for Physical and Human Resources

Moderate. Activate Contingency. Ready resources for possible deployment (This will not cost $$)

High. Move resources into position for expected deployment (This will cost $$)

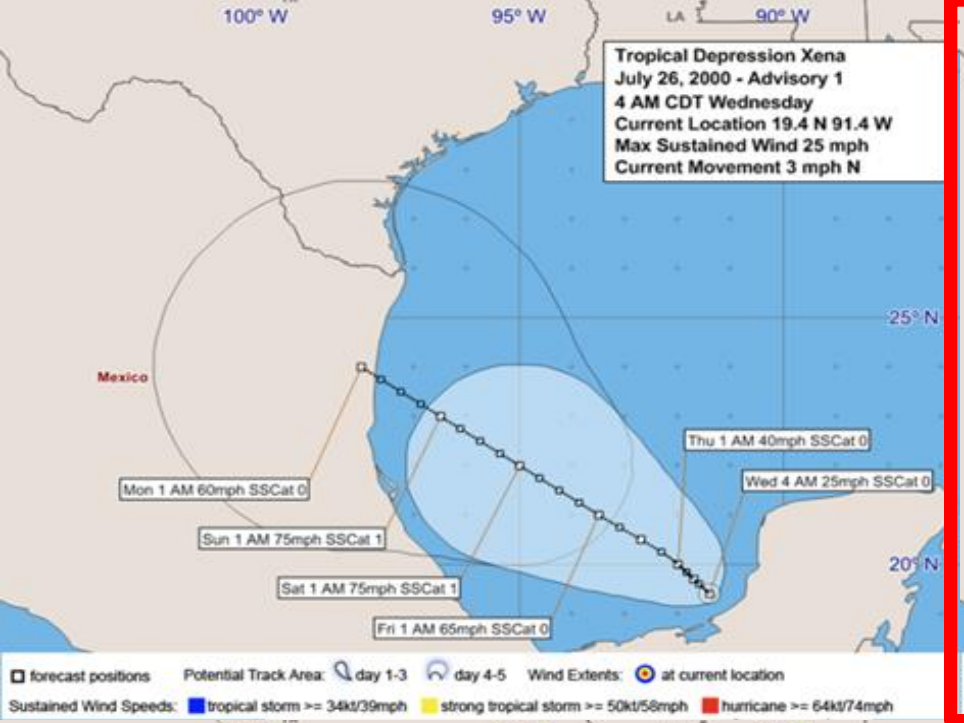
Extreme. Begin deployment (example: AirEvac, Bus movement, PUP/Depot opening and staffing. (This will cost $$)

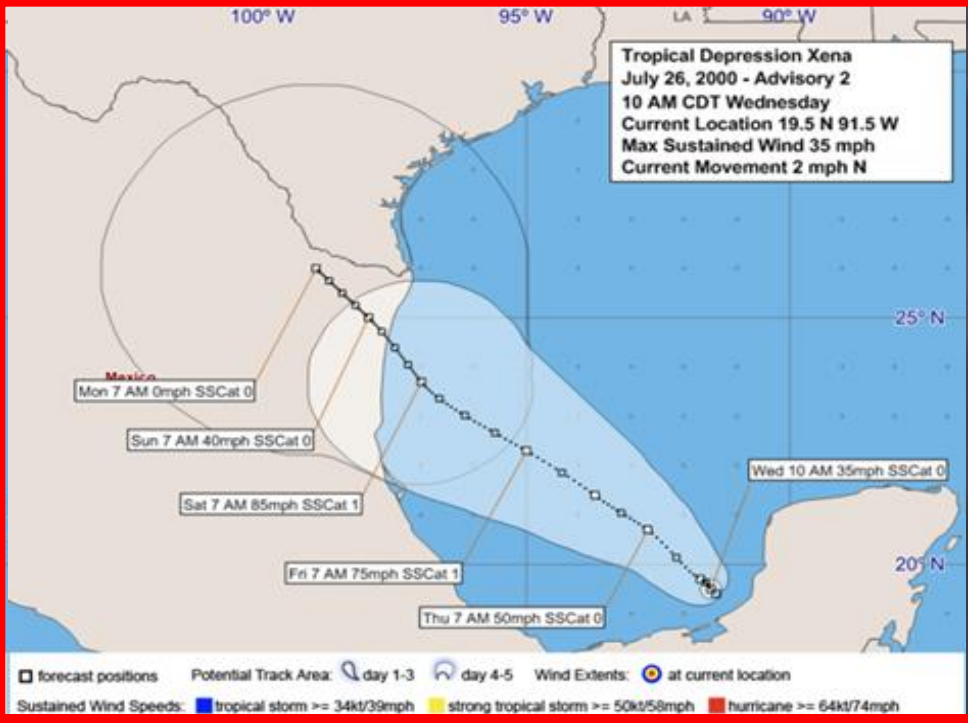
Potential Threat from TD



NWS Key Points (Advisory 1)

- Confidence Increasing for Rapid Intensification of TD (should become Xena in six to twelve hours…
- …but *Low/Very Low Confidence* in Exactly How Much Intensification
- Do not focus on track at this point; errors may be large
- Rainfall and Some Rainfall Flooding Impacts Have Highest Likelihood of Occurrence, based on history and recent heavy rain/soil moisture
- Wind is a “wildcard” ; Moderate threat based on potential for intensification (+) combined with low/very low confidence in track


100° W
95° W
LA
90° W
Tropical Depression Xena
July 26, 2000 - Advisory 1
4 AM CDT Wednesday
Current Location 19.4 N 91.4 W
Max Sustained Wind 25 mph
Current Movement 3 mph N
25° N
Mexico
Thu 1 AM 40mph SSCat 0
Wed 4 AM 25mph SSCat 0
Mon 1 AM 60mph SSCat 0
Sun 1 AM 75mph SSCat 1
Sat 1 AM 75mph SSCat 1
20° N
Fri 1 AM 65mph SSCat 0
forecast positions
Potential Track Area: day 1-3 day 4-5
Wind Extents: at current location
Sustained Wind Speeds: tropical storm >= 34kt/39mph strong tropical storm >= 50kt/58mph hurricane >= 64kt/74mph


100° W
95° W
LA
90° W
Tropical Depression Xena
July 26, 2000 - Advisory 2
10 AM CDT Wednesday
Current Location 19.5 N 91.5 W
Max Sustained Wind 35 mph
Current Movement 2 mph N
25° N
Mexico
Mon 7 AM 0mph SSCat 0
Sun 7 AM 40mph SSCat 0
Wed 10 AM 35mph SSCat 0
Sat 7 AM 85mph SSCat 1
Fri 7 AM 75mph SSCat 1
20° N
Thu 7 AM 50mph SSCat 0
forecast positions
Potential Track Area: day 1-3 day 4-5
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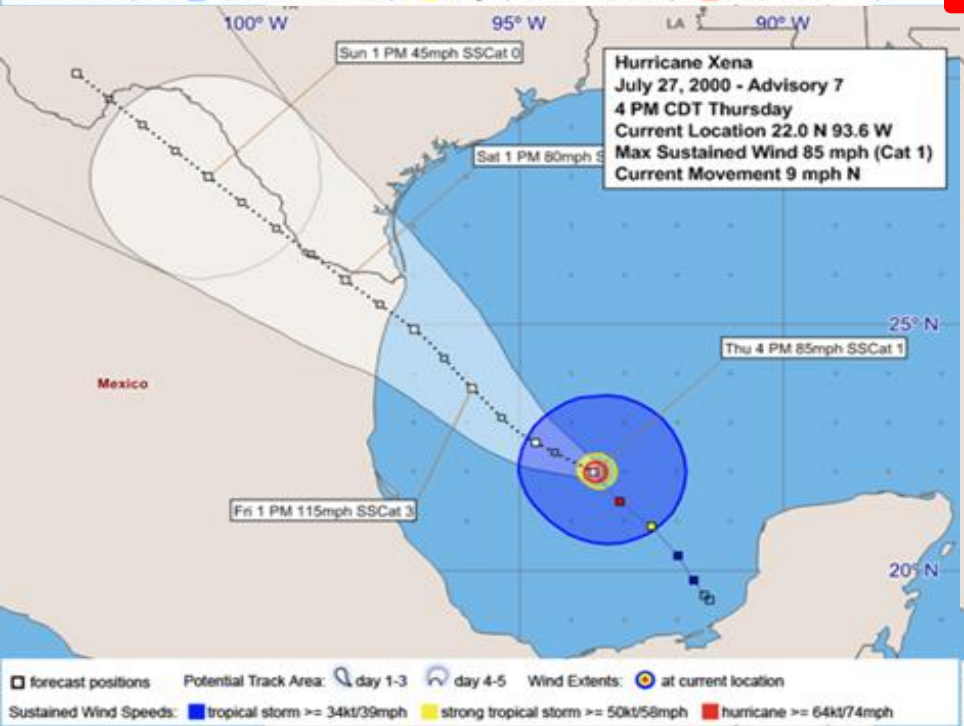
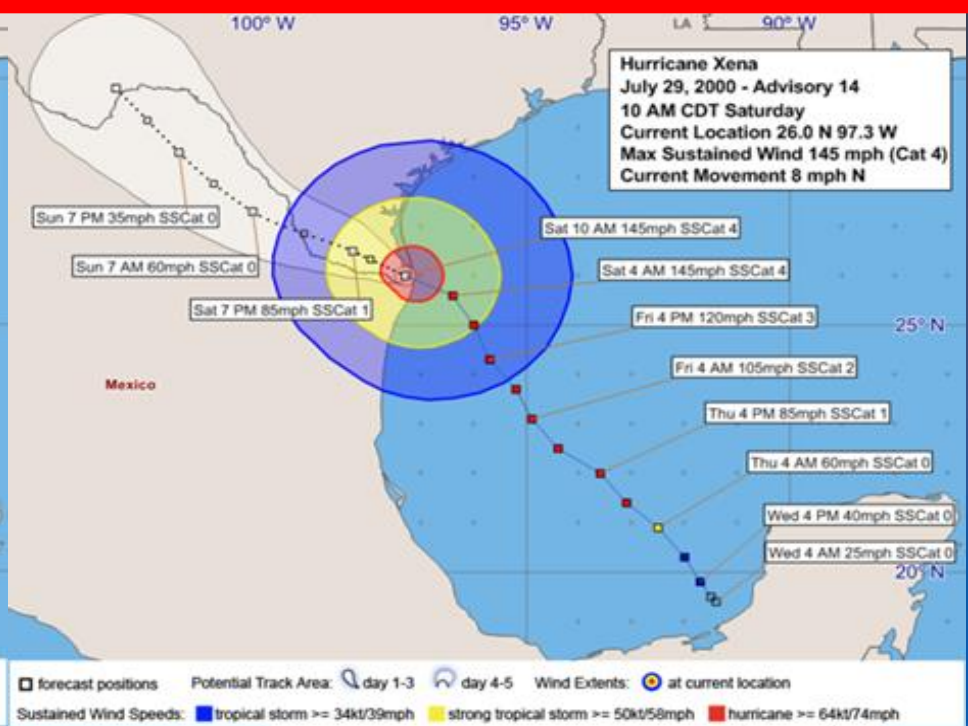
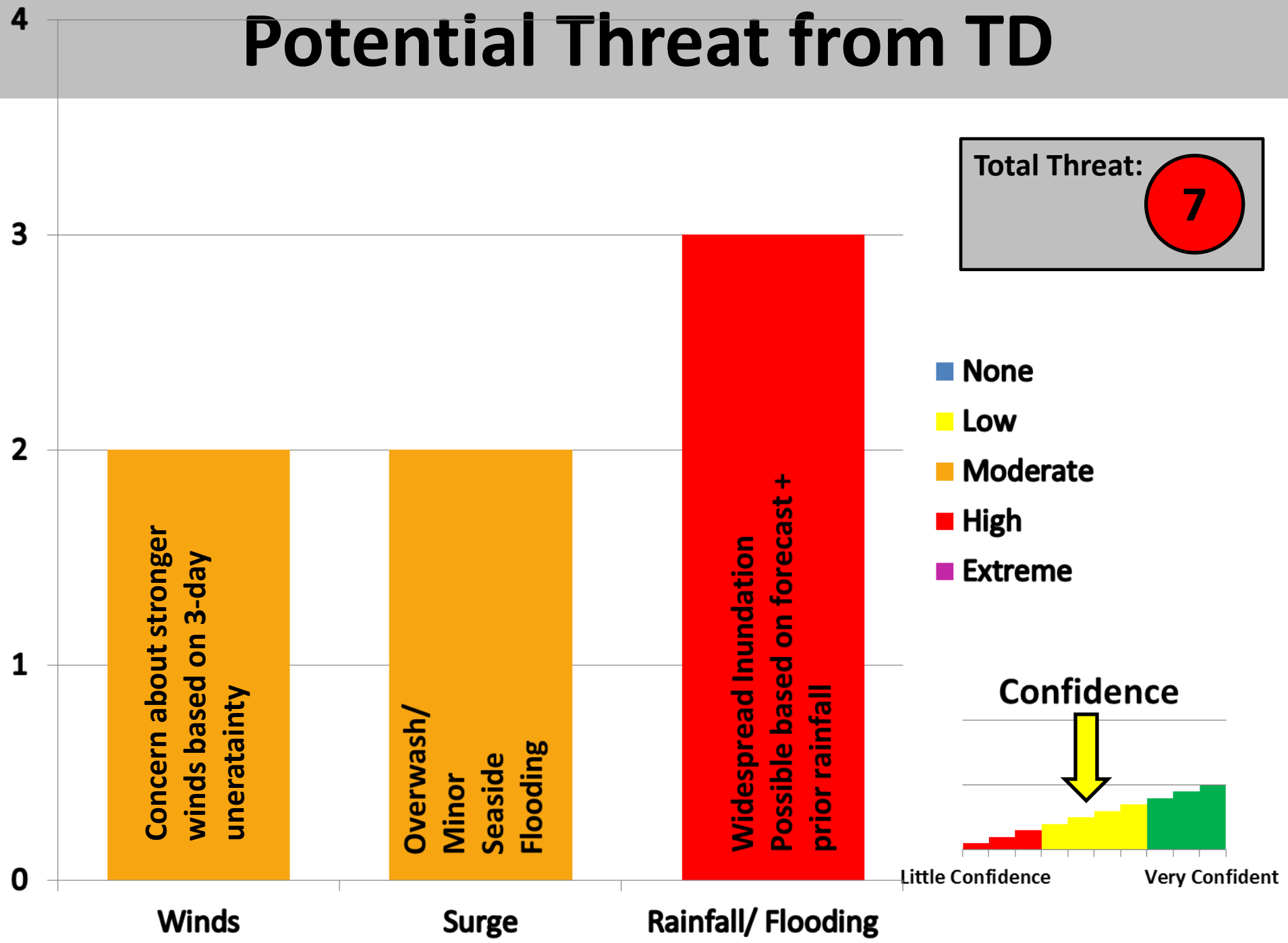

100° W
95° W
LA
90° W
Sun 1 PM 45mph SSCat 0
Hurricane Xena
July 27, 2000 - Advisory 7
4 PM CDT Thursday
Current Location 22.0 N 93.6 W
Max Sustained Wind 85 mph (Cat 1)
Current Movement 9 mph N
Sat 1 PM 80mph S
25° N
Thu 4 PM 85mph SSCat 1
Mexico
Fri 1 PM 115mph SSCat 3
20° N
forecast positions
Potential Track Area: day 1-3 day 4-5
Wind Extents: at current location
Sustained Wind Speeds: tropical storm >= 34kt/39mph strong tropical storm >= 50kt/58mph hurricane >= 64kt/74mph

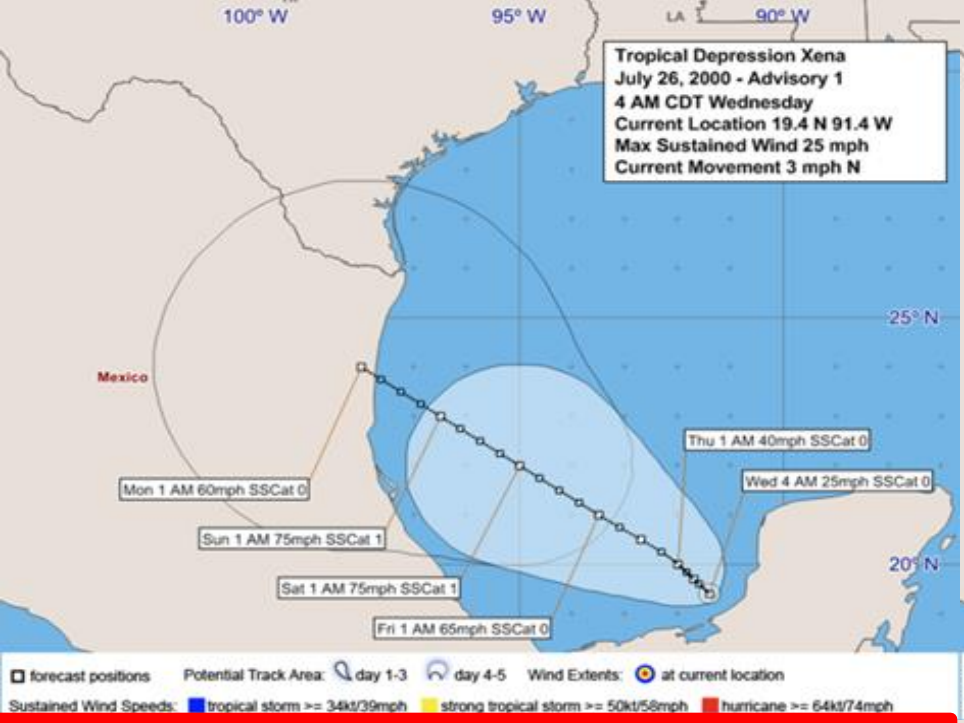

100° W
95° W
LA
90° W
Hurricane Xena
July 29, 2000 - Advisory 14
10 AM CDT Saturday
Current Location 26.0 N 97.3 W
Max Sustained Wind 145 mph (Cat 4)
Current Movement 8 mph N
Sun 7 PM 35mph SSCat 0
Sat 10 AM 145mph SSCat 4
Sun 7 AM 60mph SSCat 0
Sat 4 AM 145mph SSCat 4
Sat 7 PM 85mph SSCat 1
Fri 4 PM 120mph SSCat 3
25° N
Fri 4 AM 105mph SSCat 2
Mexico
Thu 4 PM 85mph SSCat 1
Thu 4 AM 60mph SSCat 0
Wed 4 PM 40mph SSCat 0
Wed 4 AM 25mph SSCat 0
20° N
forecast positions
Potential Track Area: day 1-3 day 4-5
Wind Extents: at current location
Sustained Wind Speeds: tropical storm >= 34kt/39mph strong tropical storm >= 50kt/58mph hurricane >= 64kt/74mph

Potential Threat from TD



NWS Key Points (Advisory 2)

- Confidence Increasing for Rapid Intensification of TD (should become Xena in six to twelve hours…
- …still *Low Confidence* in Exactly How Much Intensification
- Do not focus on track at this point; errors may be large
- Rainfall and Some Rainfall Flooding Impacts Have Highest Likelihood of Occurrence, based on history and recent heavy rain/soil moisture
- Wind is a "wildcard", but confidence increasing for potential hurricane force wind gusts to Cameron County, at least
- Northward "jog" in track and slight intensity increase bring more surge threat and change resource deployment situation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July 26, 2000 - Advisory 1
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Current Movement 3 mph N
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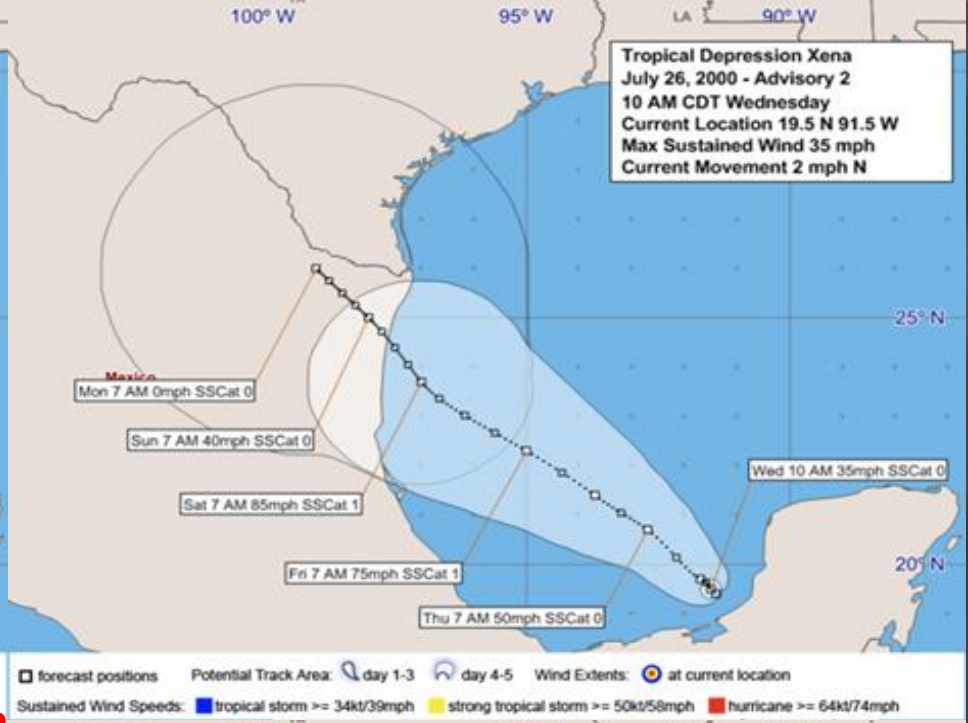
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July 26, 2000 - Advisory 2
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Current Location 19.5 N 91.5 W
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forecast positions
Potential Track Area: day 1-3 day 4-5
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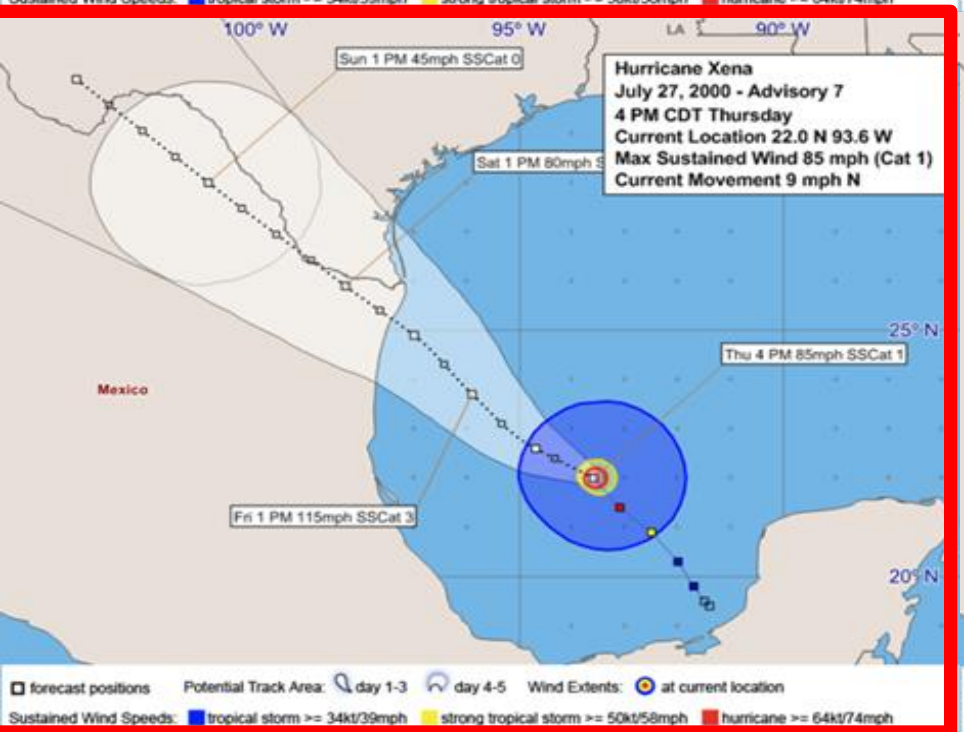
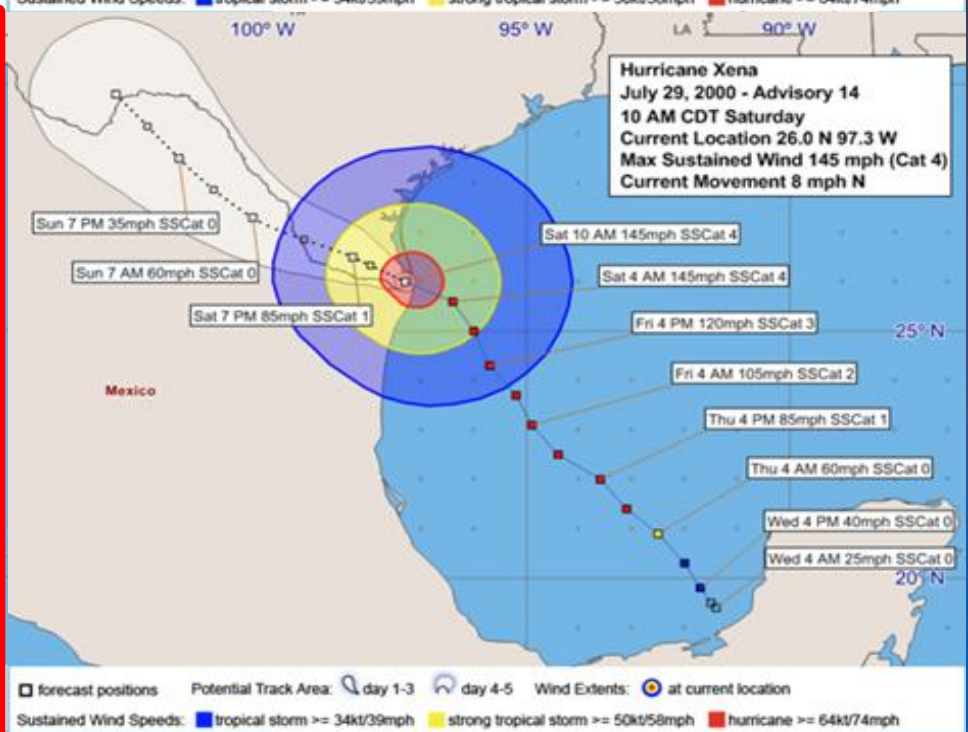

Hurricane Xena
July 27, 2000 - Advisory 7
4 PM CDT Thursday
Current Location 22.0 N 93.6 W
Max Sustained Wind 85 mph (Cat 1)
Current Movement 9 mph N
100° W
95° W
90° W
LA
25° N
20° N
Mexico
Sun 1 PM 45mph SSCat 0
Fri 1 PM 115mph SSCat 3
Thu 4 PM 85mph SSCat 1
forecast positions
Potential Track Area: day 1-3 day 4-5
Wind Extents: at current location
Sustained Wind Speeds: tropical storm >= 34kt/39mph strong tropical storm >= 50kt/58mph hurricane >= 64kt/74mph


Hurricane Xena
July 29, 2000 - Advisory 14
10 AM CDT Saturday
Current Location 26.0 N 97.3 W
Max Sustained Wind 145 mph (Cat 4)
Current Movement 8 mph N
100° W
95° W
90° W
LA
25° N
20° N
Mexico
Sun 7 PM 35mph SSCat 0
Sun 7 AM 60mph SSCat 0
Sat 7 PM 85mph SSCat 1
Sat 10 AM 145mph SSCat 4
Sat 4 AM 145mph SSCat 4
Fri 4 PM 120mph SSCat 3
Fri 4 AM 105mph SSCat 2
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Thu 4 AM 60mph SSCat 0
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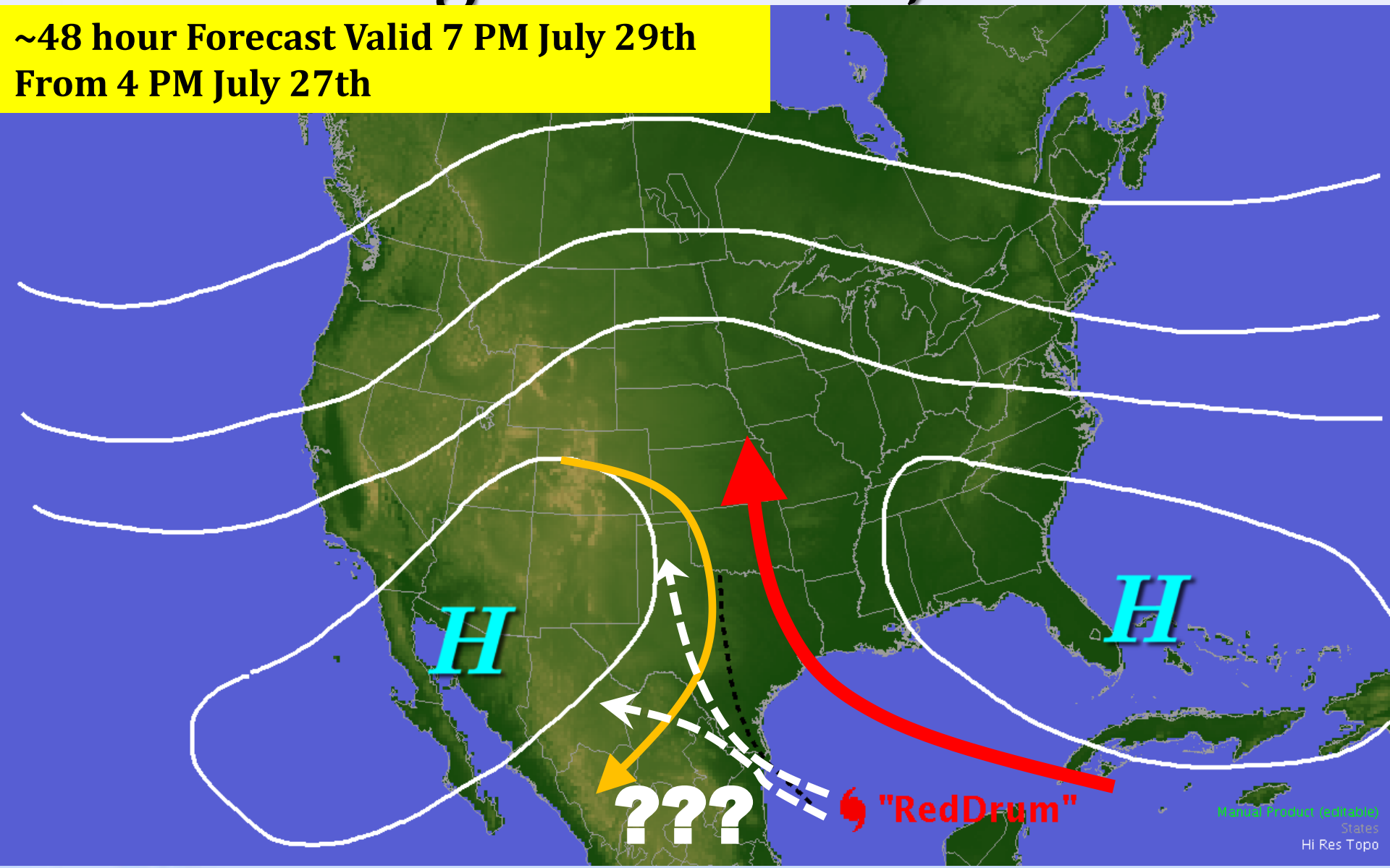
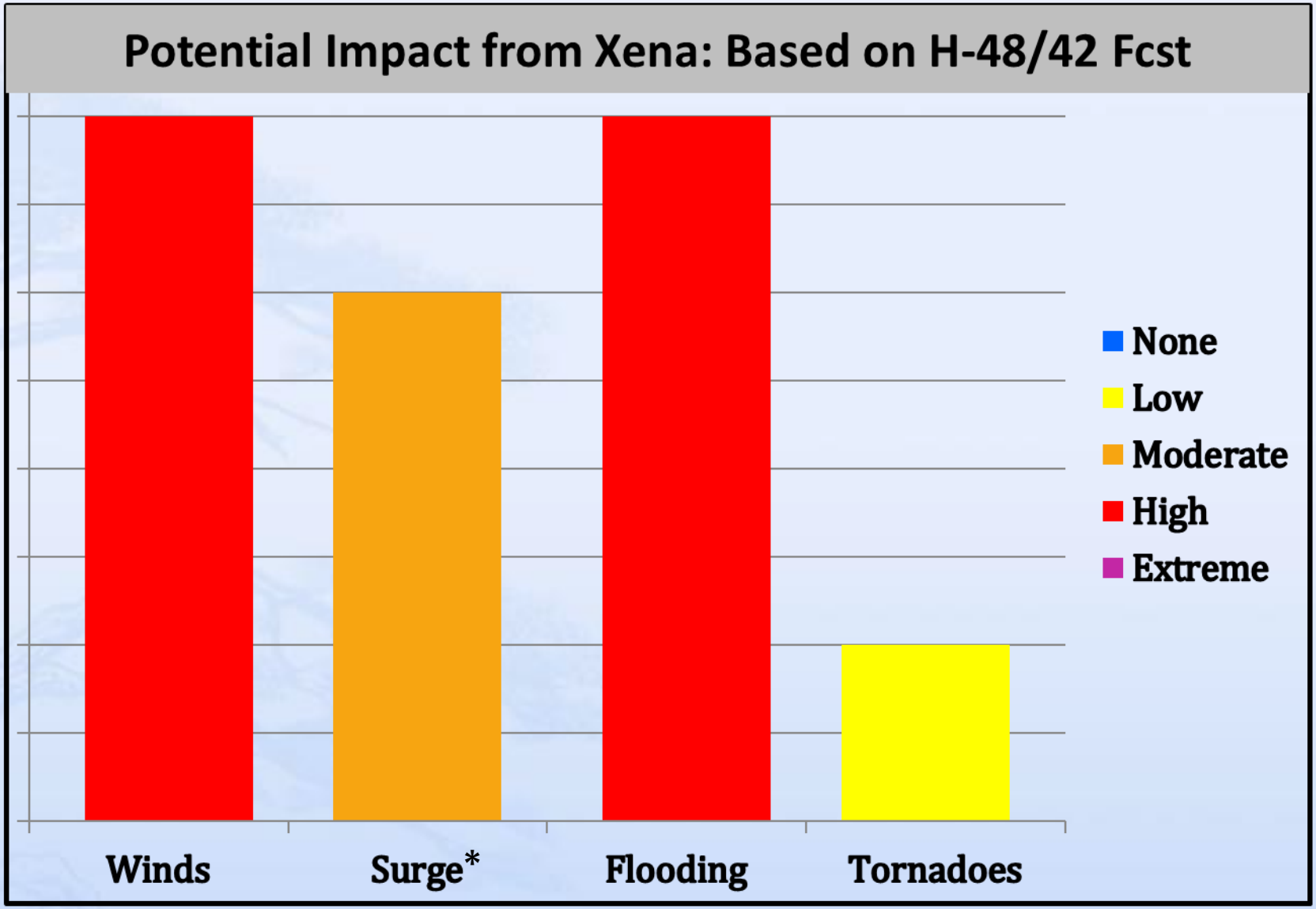
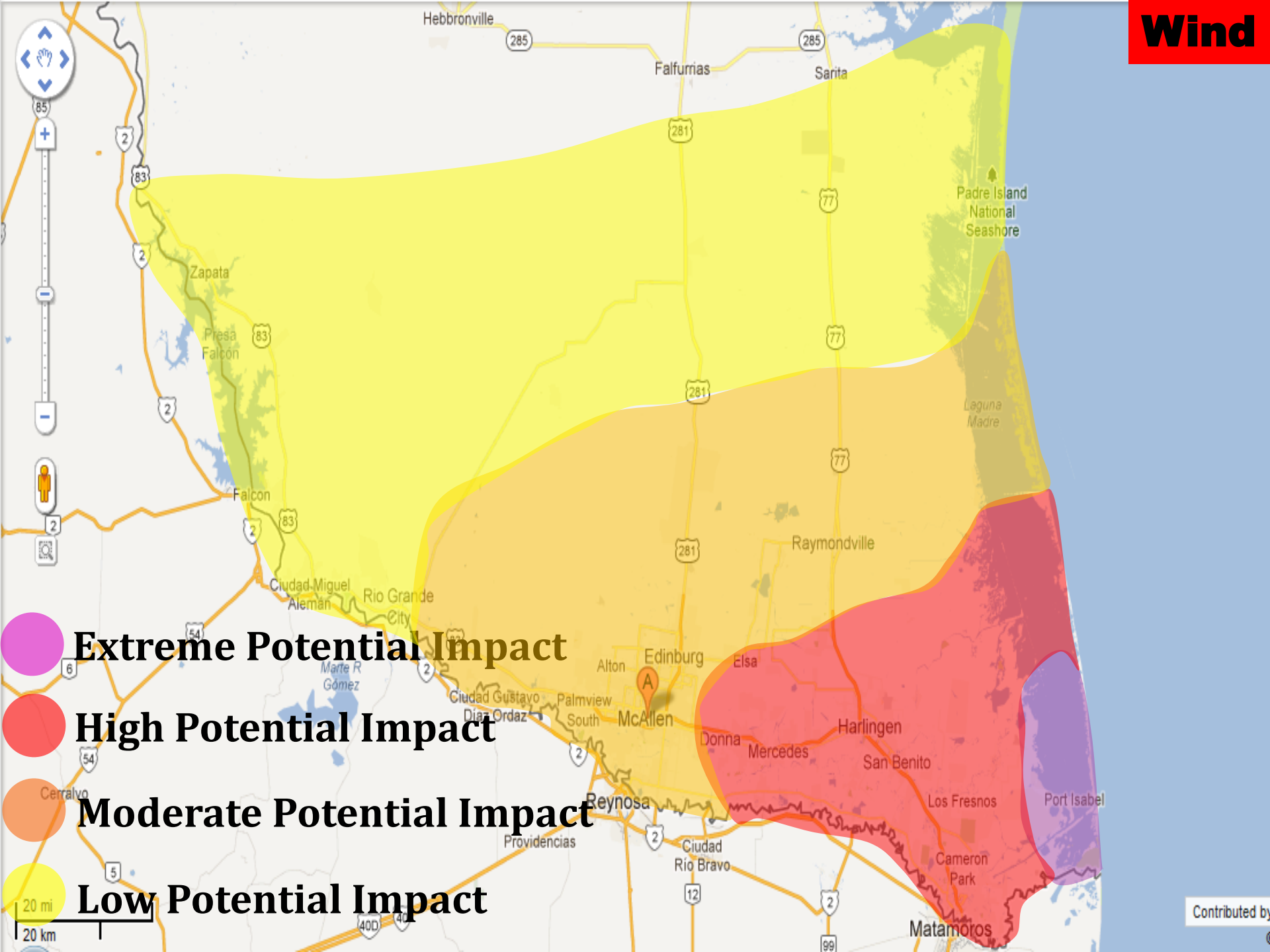
??? Steering Winds at 12,000 Feet

~48 hour Forecast Valid 7 PM July 29th
From 4 PM July 27th





*For Port Isabel-SPI-Ship Channel-Laguna Vista-Arroyo City-Port Mansfield


Wind
Extreme Potential Impact
High Potential Impact
Moderate Potential Impact
Low Potential Impact
Hebbronville
Falfurrias
Sarita
Padre Island National Seashore
Zapata
Presa Falcón
Falcon
Laguna Madre
Raymondville
Ciudad Miguel Alemán
Rio Grande City
Marte R Gómez
Alton
Edinburg
Elsa
Ciudad Gustavo Díaz Ordaz
Palmview South
McAllen
Donna
Mercedes
Harlingen
San Benito
Los Fresnos
Port Isabel
Cerralvo
Reynosa
Providencias
Ciudad Río Bravo
Cameron Park
Matamoros
20 mi
20 km
Contributed by

Impact Levels	Wind – Potential Impact Descriptions
Coastal Cameron County	**Potential for Extreme Impact:** Extremely dangerous and life-threatening winds may occur. Aggressive preparations should be made for the threat of devastating to catastrophic wind damage. **Devastating Damage** – If realized, all older mobile homes will be destroyed. Houses of poor to average construction will be destroyed or severely damaged. Moderate to major damage of well-constructed houses will include up to one half of all gabled roofs. Also, a significant number of exterior walls will fail. Aluminum and light weight steel roofs will be torn off buildings at industrial parks. Partial roof and exterior wall failure are likely at low rise apartment buildings, especially those of poor to average construction. Most windows in tall buildings will be blown out, with other minor to moderate damage possible due to swaying. Airborne debris of light to moderate weight will cause additional major damage, as well as injuries and possible loss of life. Near total power loss is expected. Many power poles will be knocked down, and numerous transformers will pop. Outages will last for weeks in some areas. The availability of potable water will be diminished as filtration systems begin to fail. Thousands of trees will be severely damaged. Up to three quarters of all healthy small to medium sized trees will snap or uproot, especially on saturated ground. Severe damage is expected to citrus orchards; some orchards may face total destruction. Most newly planted ground crops will be wiped out. Livestock left to weather the storm will be injured, some critically. Some livestock deaths are likely.
Extreme	Descriptions are consistent with sustained hurricane force winds or frequent gusts of Category 3 intensity (111 to 130 mph) as realized in hardest hit places. **Catastrophic Damage** – If realized, damage will be unprecedented. Much of the affected area will be uninhabitable for weeks, perhaps longer in spots. At least one half of well-constructed homes will have roof and wall failure. All gabled roofs will fail, and most of those homes will be destroyed. The majority of industrial buildings will become non-functional; partial to complete wall and roof damage is likely. All wood framed low rising apartment buildings will be destroyed. Concrete block or brick low rise apartments will have major damage, including some wall and roof failure. Tall buildings will sway dangerously and have most windows blown out; a few may collapse. Airborne debris will be widespread and include heavy items such as household appliances and even some light automobiles. Sport utility vehicles and light trucks will be moved or tossed. The blown debris will create

High

Brownsville/Harlingen, Mercedes, Weslaco/Donna

Potential for High Impact: Dangerous and life-threatening winds may occur. Aggressive preparations should be made for the threat of major wind damage. If realized, the majority of older mobile homes will be severely damaged or destroyed. Those that remain will be uninhabitable until repaired. Houses of poor to average construction will have major damage including partial wall collapse and roofs being lifted off. Many will be uninhabitable until repaired. Well-constructed houses will have minor to moderate damage to shingles, siding, and gutters. Many unprotected and exposed windows will be blown out. Partial roof failure is expected in industrial parks, especially to those buildings with light weight steel and aluminum coverings. Older low-rising apartment roofs may also be torn off, as well as siding and shingle damage. Airborne debris will cause damage, injury, and possible death. Power outages will be widespread, and could continue for multiple weeks in some areas. Numerous power lines will be pulled down, and a number of power poles will fall.

All trees with rotting bases will uproot or snap. Nearly all large healthy branches will snap. Some healthy trees will uproot, especially where ground is saturated. Major damage is expected to citrus orchards. Most newly planted crops will be damaged.

Descriptions are consistent with sustained hurricane force winds or frequent gusts of Category 2 intensity (96 to 110 mph) as realized in hardest hit places.

Moderate

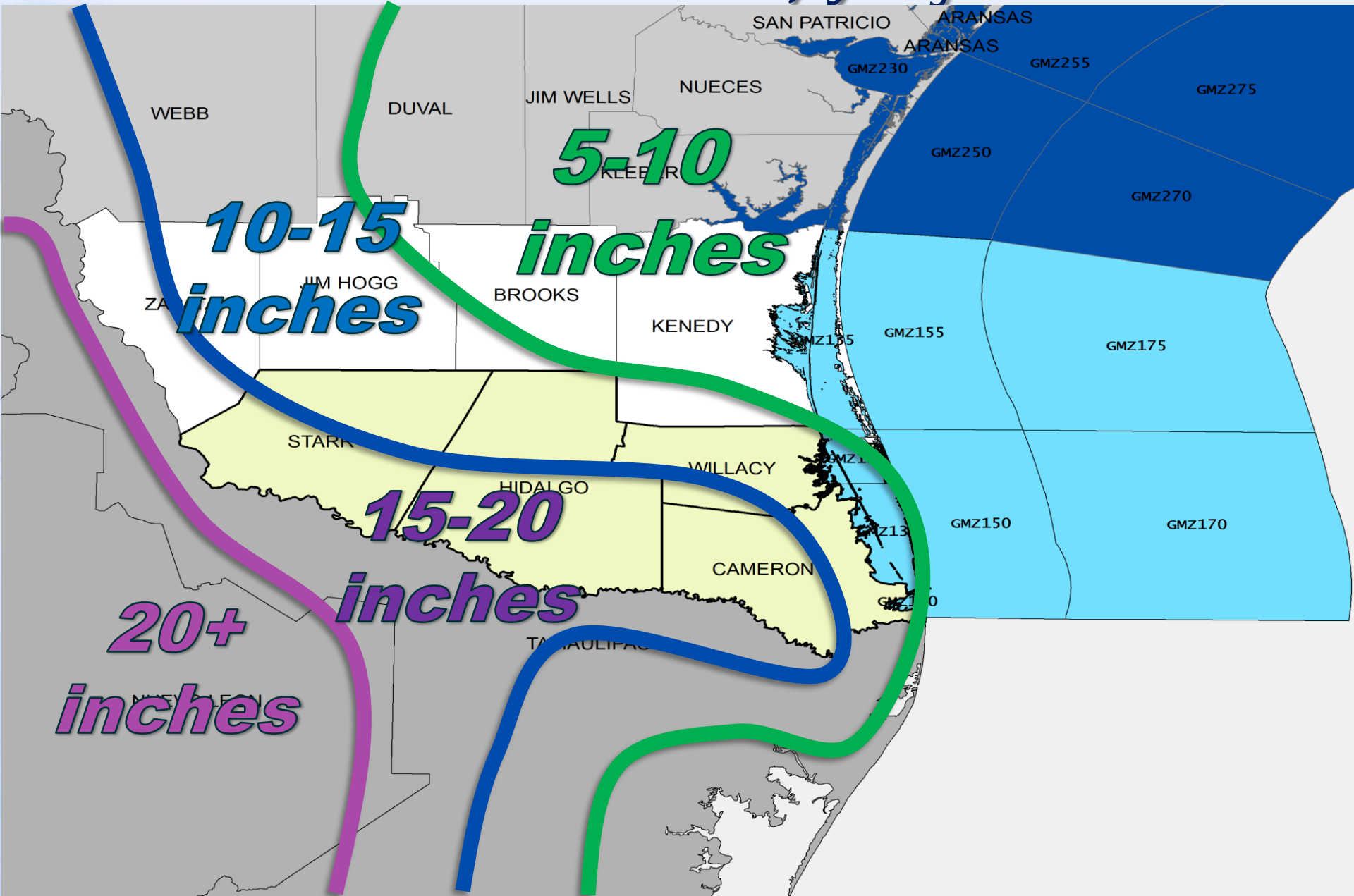
McAllen/Edinburg/Pharr, La Joya, Sullivan City

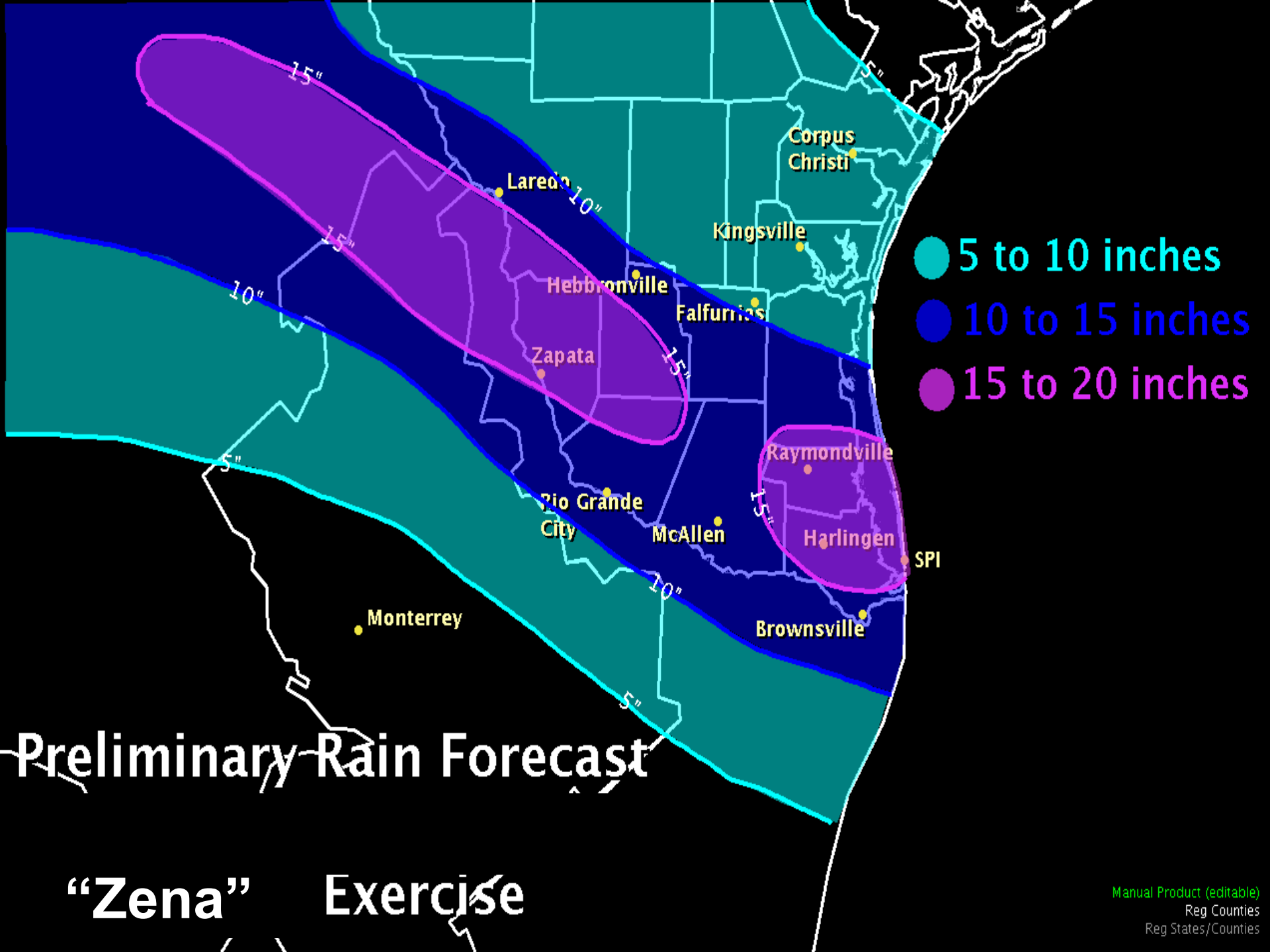
Potential for Moderate Impact: Preparations should be made for the threat of moderate wind damage. If realized, most mobile homes will experience moderate to substantial damage; those of poor construction will be destroyed. Houses of poor to average construction will have significant damage to shingles, siding, and gutters; more serious structural damage is possible. Unprotected and exposed windows are at risk of being blown out. Many screened patios will be damaged. Some well-constructed homes will also see shingle and siding damage. Unfastened light to moderate weight items will become airborne, causing additional damage and possible injury. Hundreds of power lines will be blown down; local outages will affect entire neighborhoods.

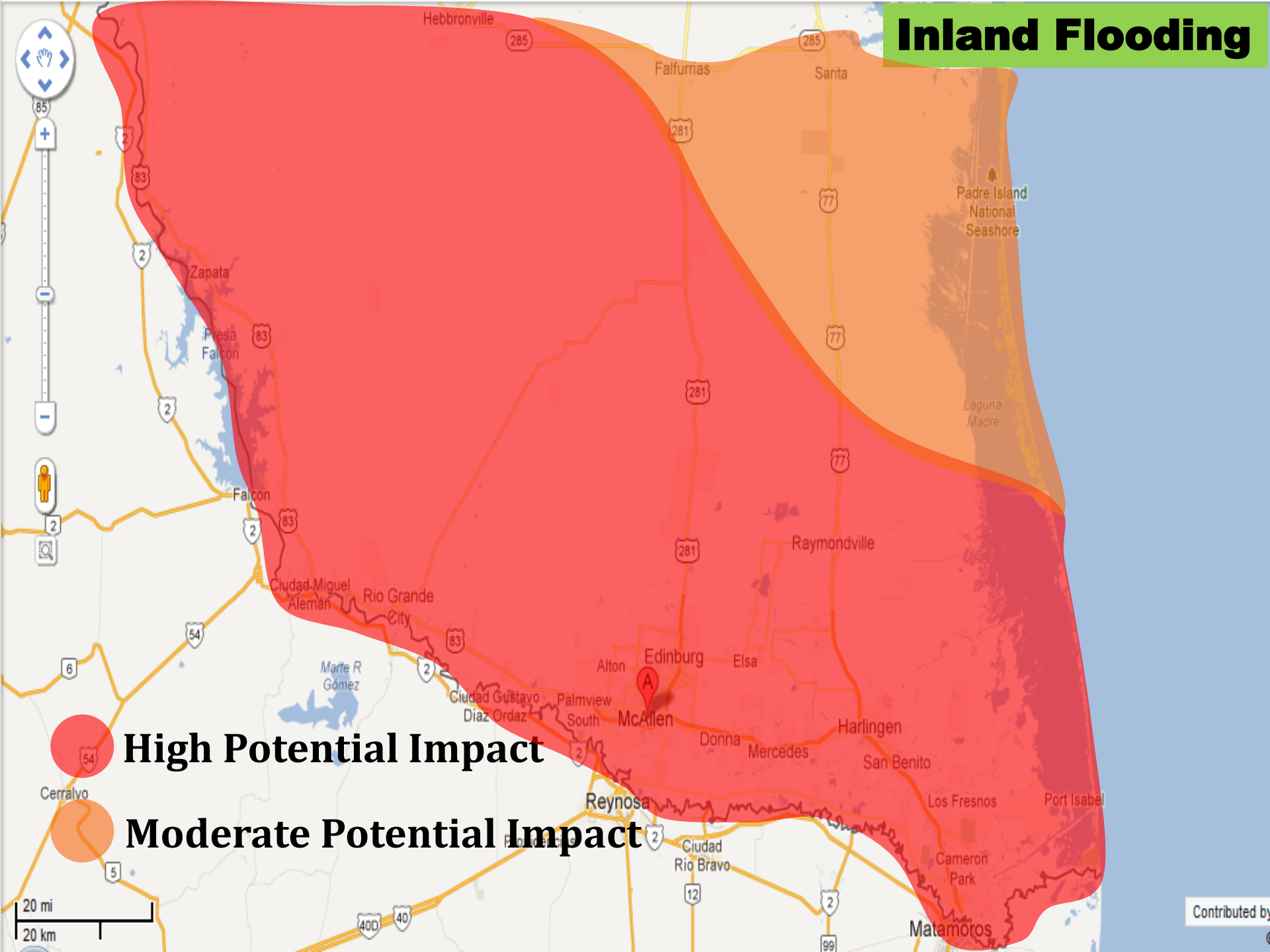
Many large branches of healthy trees will be snapped, and rotting small to medium sized trees will be uprooted. Numerous palm fronds will be blown down, and minor to moderate damage will occur to citrus orchards and newly planted lowland crops.

Descriptions are consistent with sustained hurricane force winds or frequent gusts of Category 1 intensity (74 to 95 mph) as realized in hardest hit places.

Previous Rainfall, July 16-23




5 to 10 inches
10 to 15 inches
15 to 20 inches
Corpus Christi
Laredo
Kingsville
Hebbronville
Falfurrias
Zapata
Raymondville
Rio Grande City
McAllen
Harlingen
SPI
Brownsville
Monterrey
15"
10"
5"
Preliminary Rain Forecast
"Zena" Exercise
Manual Product (editable)
Reg Counties
Reg States/Counties


Inland Flooding
High Potential Impact
Moderate Potential Impact
Hebbronville
Falfurrias
Sarita
Padre Island National Seashore
Zapata
Presa Falcón
Falcon
Laguna Madre
Raymondville
Ciudad Miguel Alemán
Rio Grande City
Marte R Gómez
Alton
Edinburg
Elsa
Ciudad Gustavo Díaz Ordaz
Palmview South
McAllen
Donna
Mercedes
Harlingen
San Benito
Los Fresnos
Port Isabel
Cerralvo
Reynosa
Ciudad Río Bravo
Cameron Park
Matamoros
20 mi
20 km
Contributed by

“Xena” Potential Rainfall Flooding

High

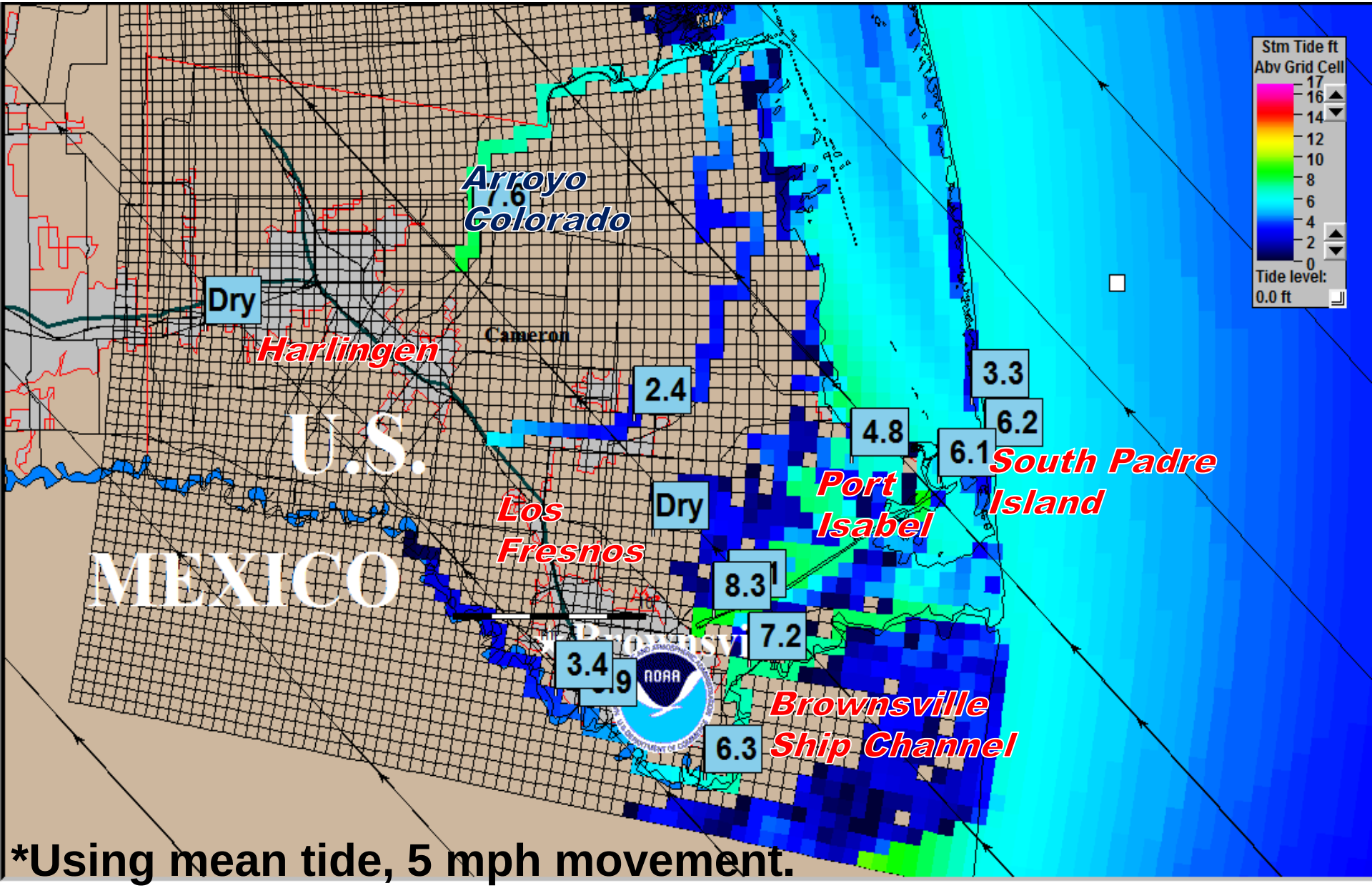
Potential for High Impact: Widespread flooding is possible. Persons living near or in poor drainage locations should make preparations to protect their lives and property. Evacuations may be necessary; heed mandatory evacuation orders.

If realized, major property damage will occur in several places along with minor to moderate damage elsewhere. Very poor drainage areas may experience over 4 feet of flood water. Other poor drainage locations will have flood water depth of 2 to 4 feet. Many resacas will overflow. Numerous main roads will be closed. Driving is discouraged except in emergencies.

All streams, creeks, and arroyos in affected areas will rise, with some reaching or exceeding flood stage/bankfull. Normally quick rising streams, creeks, and arroyos will exceed overspill their banks by several feet, flooding homes along them. Pastures will also flood; some livestock losses are likely. Several secondary roads and low-water bridges will be washed out.

Descriptions are consistent with a critical threat to life and property and the likelihood for higher rain totals to well exceed flash flood thresholds.

Potential Inundation, Xena (First Guess)*



*Using mean tide, 5 mph movement.

Xena - Potential Flooding from the Sea

High

Potential for High Impact: Dangerous and life-threatening inundation may occur. Aggressive preparations should be made for the threat of major coastal flood damage from sea water. If realized, most coastal communities will be inundated, especially if the surge arrives during high tide. People who do not heed evacuation orders may drown. Many shoreline structures of average construction which are not elevated above the waterline will be destroyed; widespread, sometimes devastating personal property damage is likely elsewhere. Moderate to major damage is expected to marinas, docks, and piers. Many small craft will break away from their moorings, especially in unprotected anchorages.

Vehicles left behind in evacuated areas will likely be damaged or swept away. Numerous roads will be swamped; some possibly washed away. Entire flood-prone coastal communities may be cutoff for an extended period with sea water several feet deep reaching more than a mile inland. Coastal residents in multi-story facilities also risk being cutoff. Flood conditions will be worsened by battering waves on top of storm surge and tide. Such waves will exacerbate property damage, increasing the potential for destruction of homes and businesses, even those of block construction. Damage from beach erosion could take a year or more to restore.

Descriptions are consistent with the likelihood for widespread inundation with local water depths of 5 to 7 feet (above ground level) in hardest hit places. Relative to impact potential, a comparable event in recent history is Hurricane Beulah in 1967.

Moderate

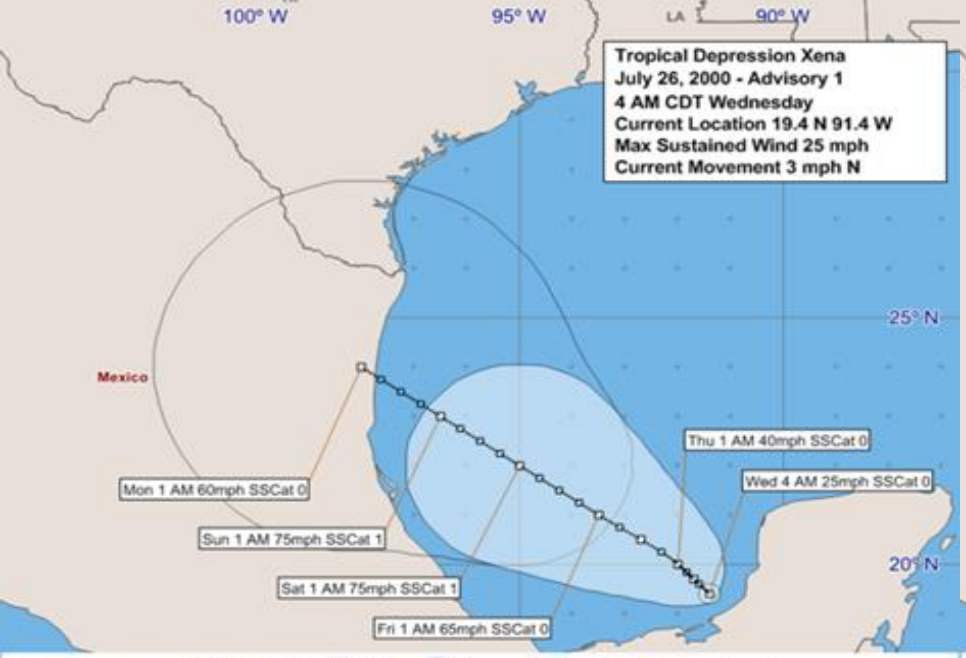
Potential for Moderate Impact: Preparations should be made for the threat of moderate coastal flood damage from sea water. If realized, all residents living along the shoreline will need to protect against sea water entering their homes or businesses, especially during periods of high tide. For those particularly vulnerable, several feet of water may enter low-lying structures causing them to become uninhabitable. Flood-prone coastal communities may be temporarily cutoff, with sea water reaching more than a mile inland. People who do not heed evacuation orders may face life-threatening consequences. Those living in single story dwellings are at greatest risk, but even those in multi-story dwellings risk being cutoff.

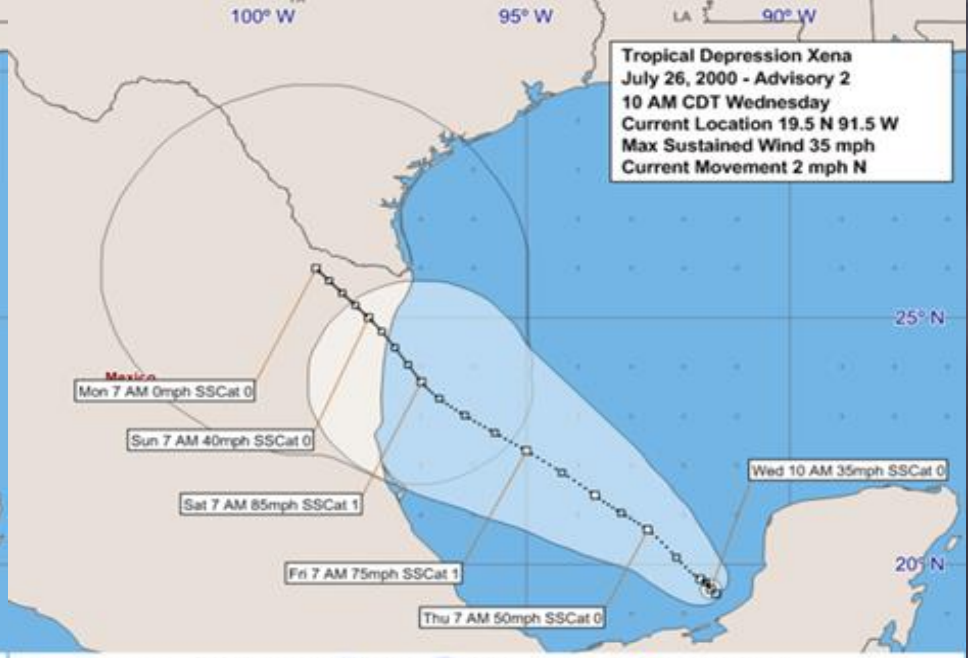
Vehicles left behind in evacuated areas will be susceptible to damage or destruction. Minor to moderate damage is expected to marinas, docks, and piers. Several small craft will break away from moorings, especially in unprotected anchorages. Conditions will be worsened by increased wave action on top of the storm surge and tide. Such waves will exacerbate shoreline property damage, increasing the potential for destroying homes and washing away vehicles. Beach erosion will be substantial and may require months to restore.

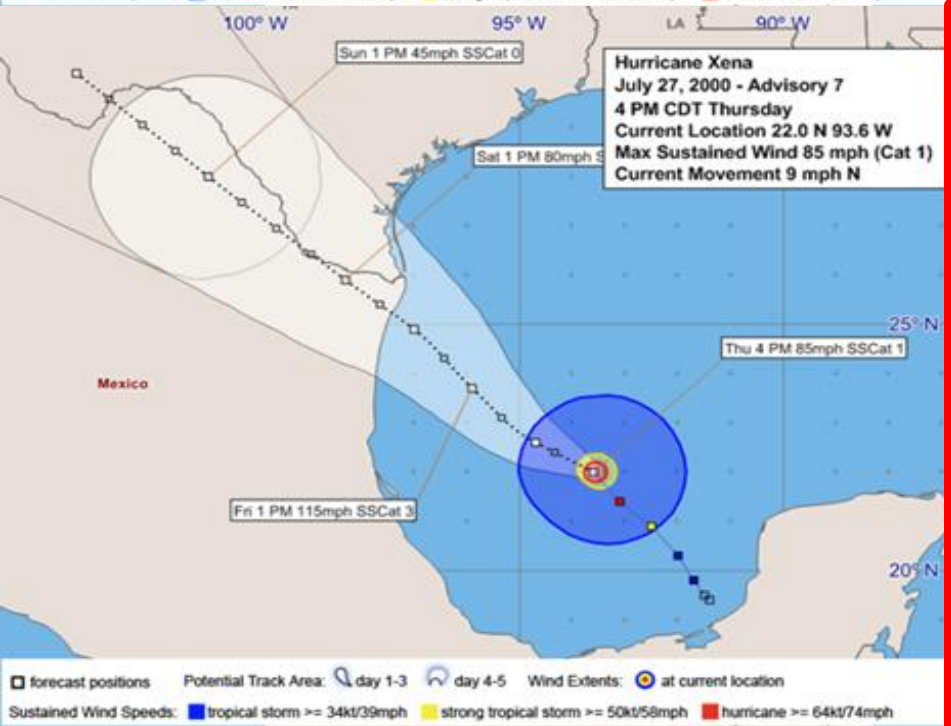
Descriptions are consistent with the likelihood for partial inundation with local water depths of 3 to 5 feet (above ground level) in hardest hit places.

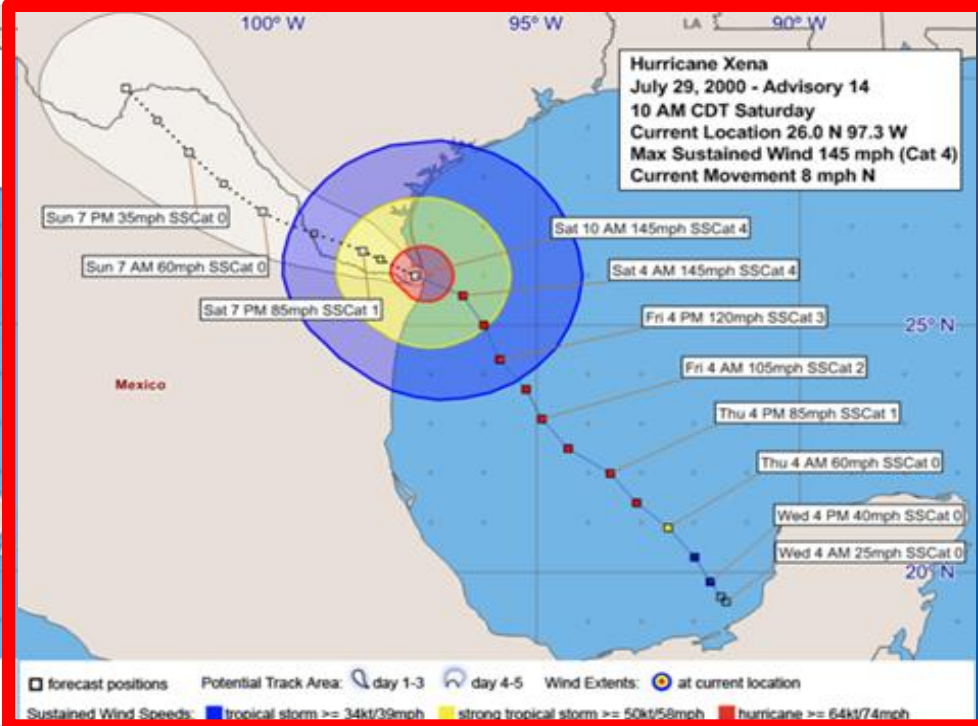
NWS Key Points (Advisory 7)

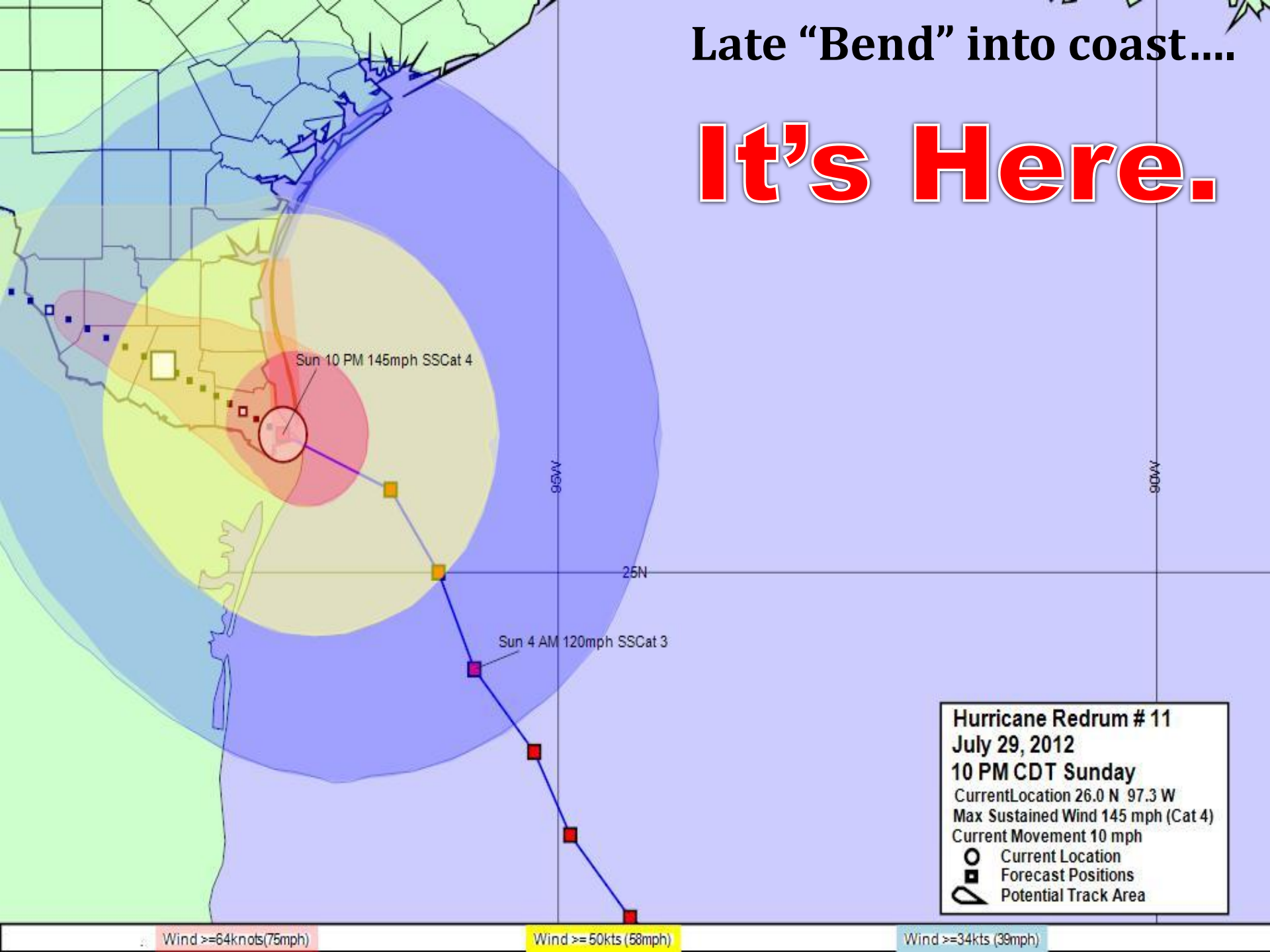
- Xena Certain to Become a Major (Cat 3 or greater) Hurricane
- Confidence High on Increasing Size as Cyclone Gains Latitude
- Confidence Medium on Exact Track…
  - *…But Near Certainty for some RGV Impacts*
- Inland Flooding a Primary Concern…
  - *Some areas may see 30+ inches of rain from this and prior events; Hidalgo County is in this potential area*
  - *Some shelters have potential to become "islands"*
- Wind is becoming a Primary Concern…
  - *Still uncertainty as to rapid intensification, which could increase damage potential and inland penetration of destructive winds*
  - *Expected slowdown could create significant differences in impact between Port Isabel and McAllen*
- Surge a Secondary Concern, but tricky…
  - *Confidence is low with current forecast…potential for stronger, slower, and larger storm could increase impacts and inundation level*


100° W
95° W
90° W
LA
Tropical Depression Xena
July 26, 2000 - Advisory 1
4 AM CDT Wednesday
Current Location 19.4 N 91.4 W
Max Sustained Wind 25 mph
Current Movement 3 mph N
25° N
20° N
Mexico
Thu 1 AM 40mph SSCat 0
Wed 4 AM 25mph SSCat 0
Mon 1 AM 60mph SSCat 0
Sun 1 AM 75mph SSCat 1
Sat 1 AM 75mph SSCat 1
Fri 1 AM 65mph SSCat 0
forecast positions
Potential Track Area: day 1-3 day 4-5
Wind Extents: at current location
Sustained Wind Speeds: tropical storm >= 34kt/39mph
strong tropical storm >= 50kt/58mph
hurricane >= 64kt/74mph


100° W
95° W
90° W
LA
Tropical Depression Xena
July 26, 2000 - Advisory 2
10 AM CDT Wednesday
Current Location 19.5 N 91.5 W
Max Sustained Wind 35 mph
Current Movement 2 mph N
25° N
20° N
Mexico
Mon 7 AM 0mph SSCat 0
Sun 7 AM 40mph SSCat 0
Wed 10 AM 35mph SSCat 0
Sat 7 AM 85mph SSCat 1
Fri 7 AM 75mph SSCat 1
Thu 7 AM 50mph SSCat 0
forecast positions
Potential Track Area: day 1-3 day 4-5
Wind Extents: at current location
Sustained Wind Speeds: tropical storm >= 34kt/39mph
strong tropical storm >= 50kt/58mph
hurricane >= 64kt/74mph

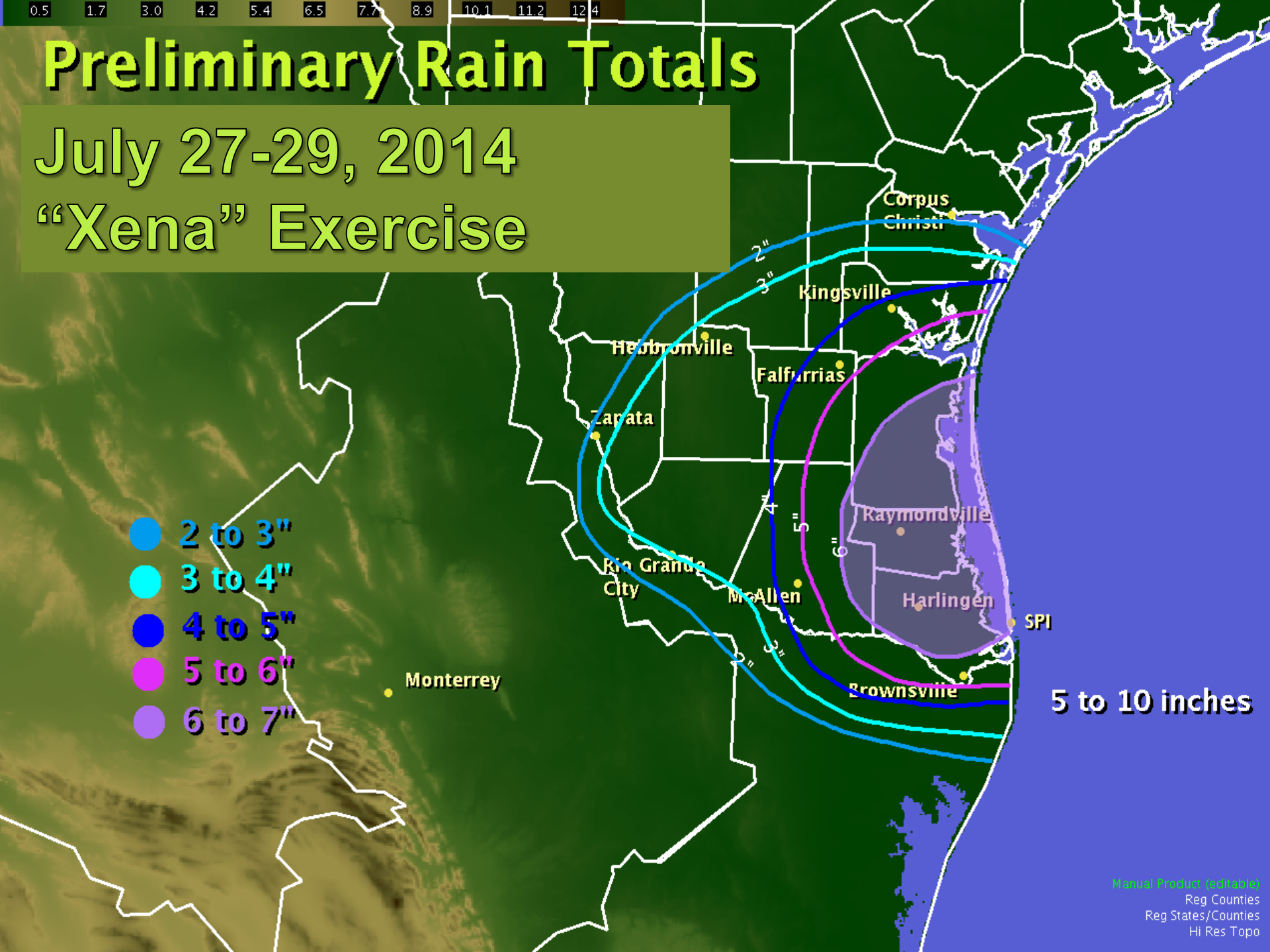

100° W
95° W
90° W
LA
Sun 1 PM 45mph SSCat 0
Hurricane Xena
July 27, 2000 - Advisory 7
4 PM CDT Thursday
Current Location 22.0 N 93.6 W
Max Sustained Wind 85 mph (Cat 1)
Current Movement 9 mph N
Sat 1 PM 80mph S
25° N
20° N
Mexico
Thu 4 PM 85mph SSCat 1
Fri 1 PM 115mph SSCat 3
forecast positions
Potential Track Area: day 1-3 day 4-5
Wind Extents: at current location
Sustained Wind Speeds: tropical storm >= 34kt/39mph
strong tropical storm >= 50kt/58mph
hurricane >= 64kt/74mph


100° W
95° W
90° W
LA
Hurricane Xena
July 29, 2000 - Advisory 14
10 AM CDT Saturday
Current Location 26.0 N 97.3 W
Max Sustained Wind 145 mph (Cat 4)
Current Movement 8 mph N
Sun 7 PM 35mph SSCat 0
Sat 10 AM 145mph SSCat 4
Sun 7 AM 60mph SSCat 0
Sat 4 AM 145mph SSCat 4
Sat 7 PM 85mph SSCat 1
Fri 4 PM 120mph SSCat 3
25° N
20° N
Mexico
Fri 4 AM 105mph SSCat 2
Thu 4 PM 85mph SSCat 1
Thu 4 AM 60mph SSCat 0
Wed 4 PM 40mph SSCat 0
Wed 4 AM 25mph SSCat 0
forecast positions
Potential Track Area: day 1-3 day 4-5
Wind Extents: at current location
Sustained Wind Speeds: tropical storm >= 34kt/39mph
strong tropical storm >= 50kt/58mph
hurricane >= 64kt/74mph


Late "Bend" into coast....
It's Here.
Sun 10 PM 145mph SSCat 4
Sun 4 AM 120mph SSCat 3
95W
90W
25N
Hurricane Redrum # 11
July 29, 2012
10 PM CDT Sunday
CurrentLocation 26.0 N 97.3 W
Max Sustained Wind 145 mph (Cat 4)
Current Movement 10 mph
Current Location
Forecast Positions
Potential Track Area
Wind >=64knots(75mph)
Wind >= 50kts (58mph)
Wind >=34kts (39mph)

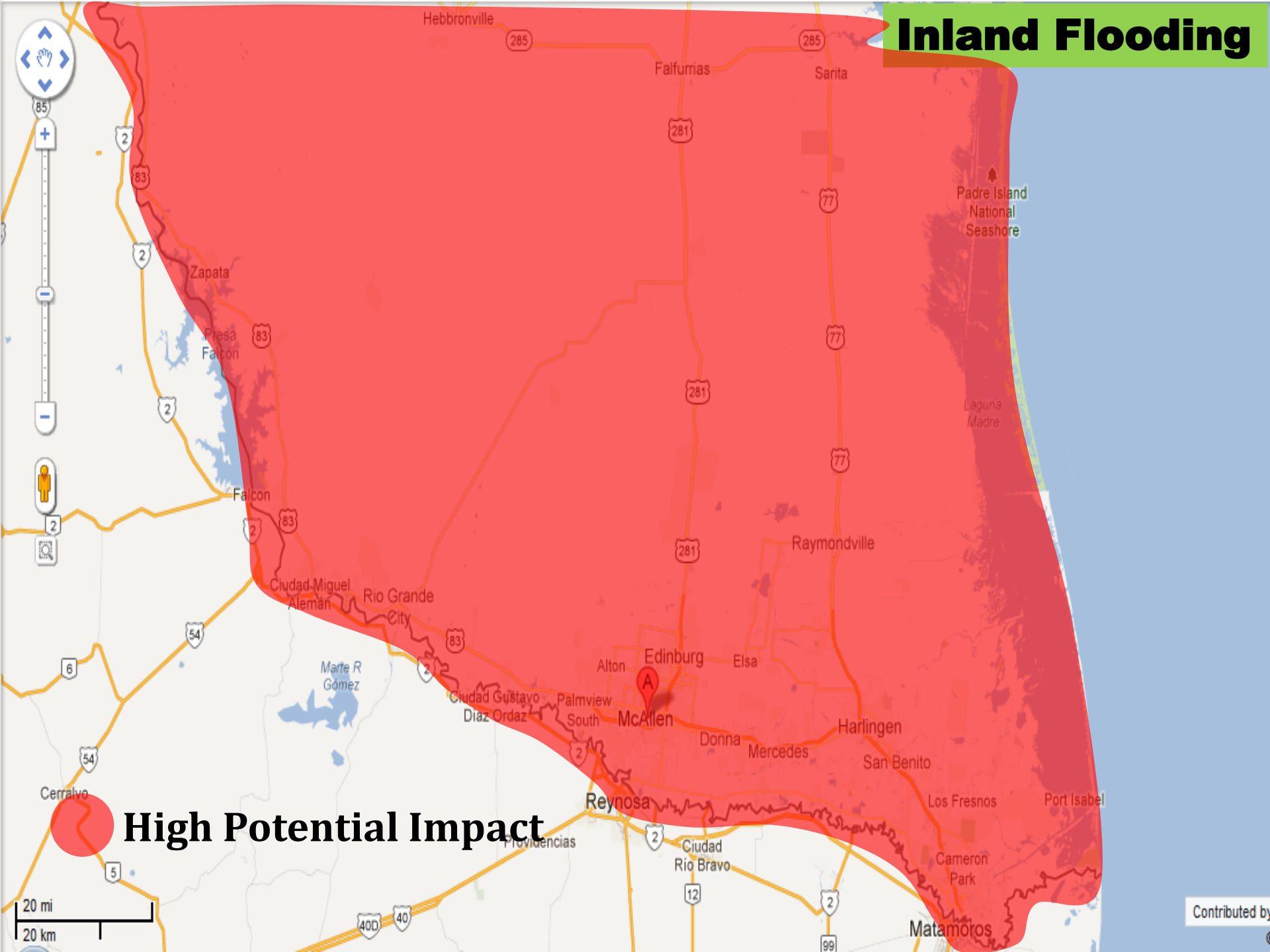
Tale of the Tape

- Red Rum Pounding eastern Cameron County with **145 mph peak wind**. Gust of 110 mph recorded at SPI Heliport at 7 PM before system stopped.
- Cell Phone and Power Out SPI, Port Isabel, Laguna Vista, etc.
- **Gusts to 65 mph** at McAllen/Miller Airport.
- **Storm Surge Flooding on SPI unknown extent of sea water height.** Brownsville Ship Channel flooded with 7 to 9 feet of water overtopping.
- **Major flooding** in Brownsville and Harlingen's poor drainage areas with 4 feet of water reported.
- Location of Center: Near Port Isabel.
- **Location of Eyewall: SPI, Los Fresnos, Brownsville.**

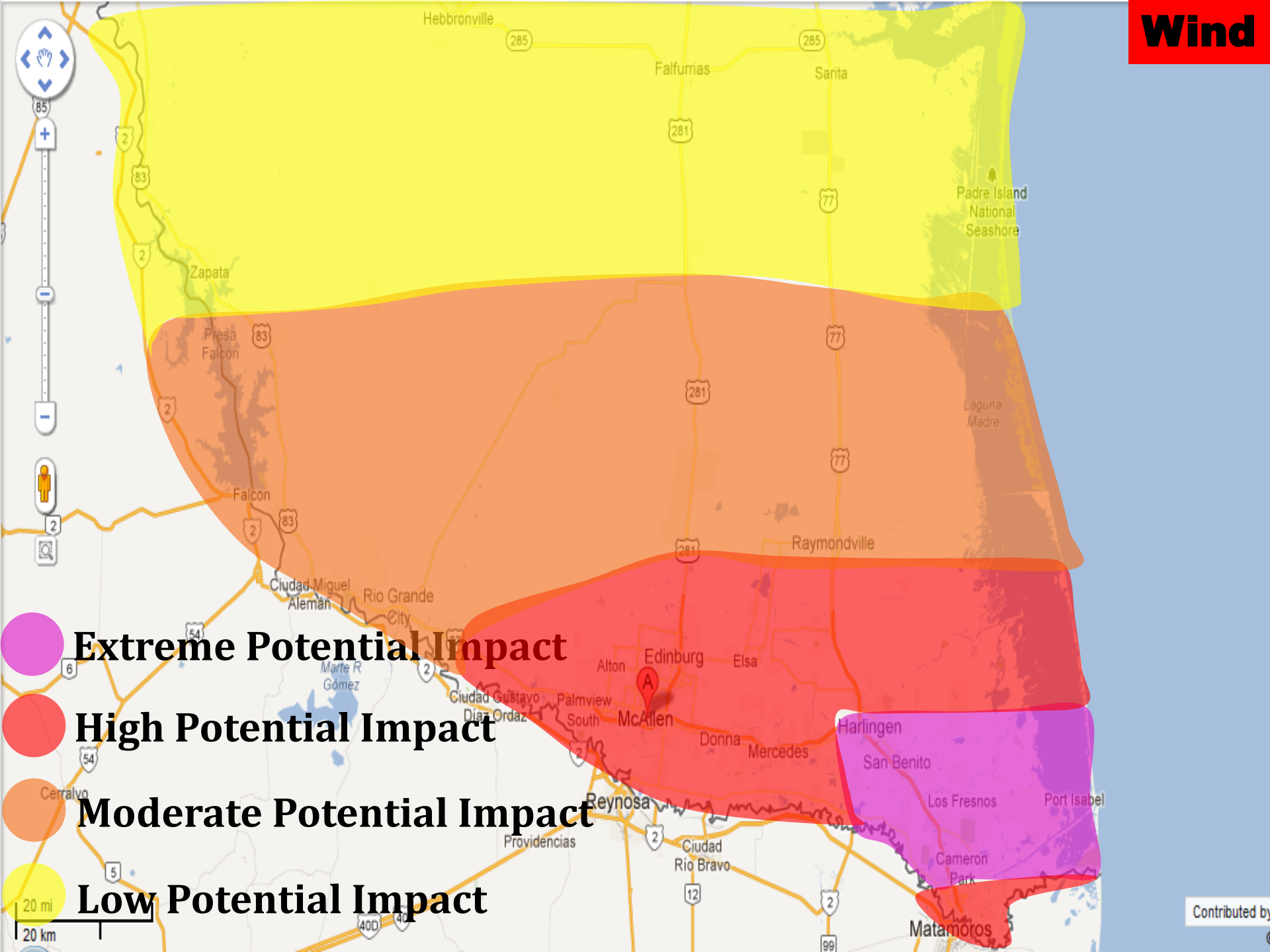

0.5 1.7 3.0 4.2 5.4 6.5 7.7 8.9 10.1 11.2 12.4
Preliminary Rain Totals
July 27-29, 2014
"Xena" Exercise
Corpus Christi
Kingsville
Falfurrias
Zapata
Raymondville
Harlingen
SPI
Brownsville
McAllen
Monterrey
2"
3"
4"
5"
6"
2 to 3"
3 to 4"
4 to 5"
5 to 6"
6 to 7"
5 to 10 inches
Manual Product (editable)
Reg Counties
Reg States/Counties
Hi Res Topo

Flood Control Project?

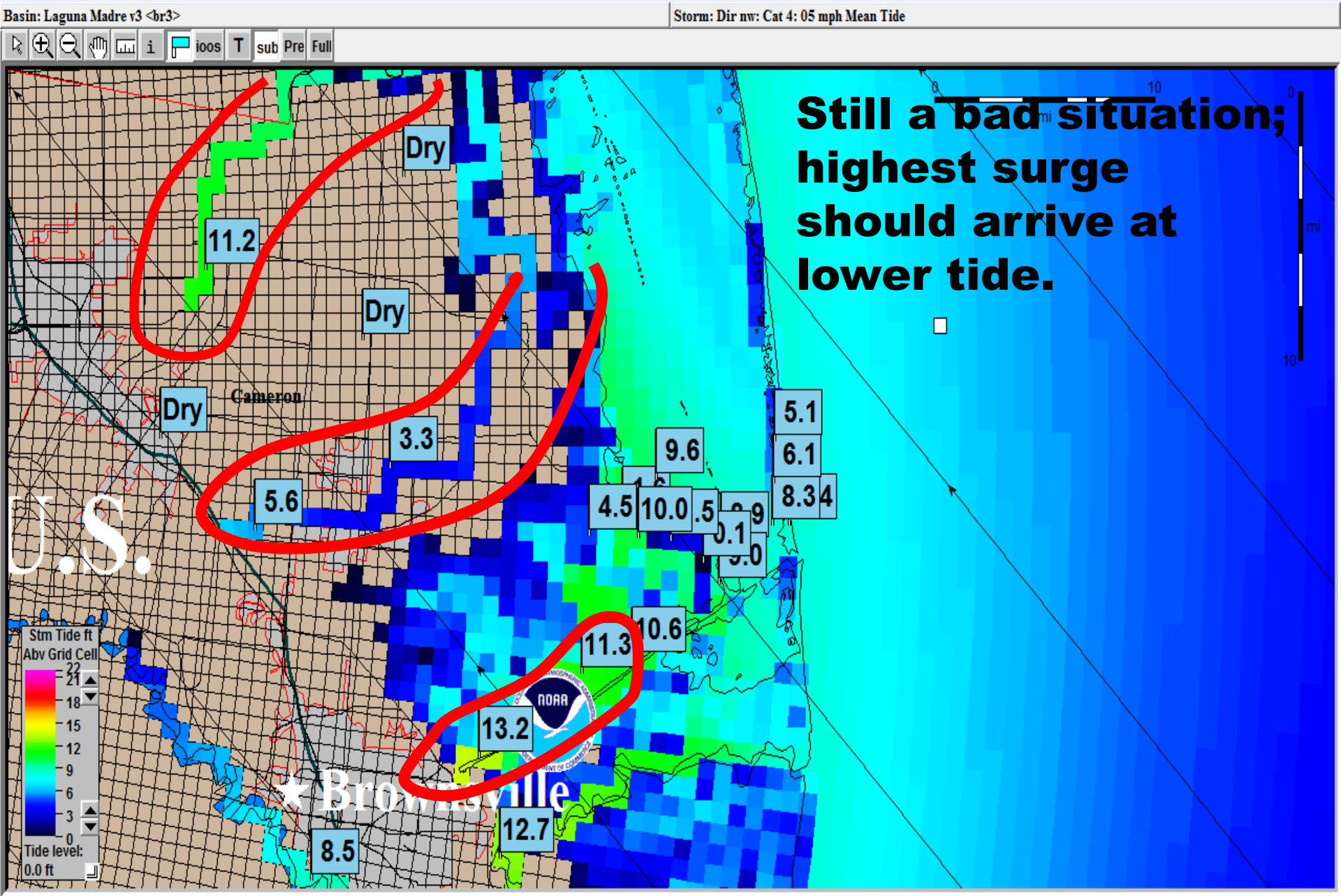
- Based on antecedent and forecast rainfall in the Rio Grande Basin…
  - Up to 30 inches will have fallen in less than 3 weeks
  - Dam releases required and RGV floodway opened…
  - …Impacts and levels much less than Alex and 1971. Similar to Gilbert (1988)


Inland Flooding
High Potential Impact
Hebbronville
Falfurrias
Sarita
Padre Island National Seashore
Zapata
Presa Falcón
Falcon
Laguna Madre
Raymondville
Ciudad Miguel Alemán
Rio Grande City
Marte R Gómez
Alton
Edinburg
Elsa
Ciudad Gustavo Díaz Ordaz
Palmview South
McAllen
Donna
Mercedes
Harlingen
San Benito
Los Fresnos
Port Isabel
Cerralvo
Reynosa
Providencias
Ciudad Río Bravo
Cameron Park
Matamoros
20 mi
20 km
Contributed by

High	**Potential for High Impact:** Widespread flooding is possible. Persons living near or in poor drainage locations should make preparations to protect their lives and property. Evacuations may be necessary; heed mandatory evacuation orders. If realized, major property damage will occur in several places along with minor to moderate damage elsewhere. Very poor drainage areas may experience over 4 feet of flood water. Other poor drainage locations will have flood water depth of 2 to 4 feet. Many resacas will overflow. Numerous main roads will be closed. Driving is discouraged except in emergencies. All streams, creeks, and arroyos in affected areas will rise, with some reaching or exceeding flood stage/bankfull. Normally quick rising streams, creeks, and arroyos will exceed overspill their banks by several feet, flooding homes along them. Pastures will also flood; some livestock losses are likely. Several secondary roads and low-water bridges will be washed out. Descriptions are consistent with a critical threat to life and property and the likelihood for higher rain totals to well exceed flash flood thresholds.
Moderate	**Potential for Moderate Impact:** Residents should prepare for areas of flooding, especially in poor drainage locations. If realized, minor to moderate property damage will occur and several main thoroughfares may be closed. Known intersections with very poor drainage may experience 2 to 4 feet of flood water. Other poor drainage areas may have flood water depth up to 2 feet. Most small streams and arroyos will approach, or possibly exceed, bankfull. Descriptions are consistent with a significant threat to life and property and the likelihood for rain totals to exceed flash flood thresholds.


Wind
Extreme Potential Impact
High Potential Impact
Moderate Potential Impact
Low Potential Impact
Hebbronville
Falfurrias
Sarita
Padre Island National Seashore
Zapata
Presa Falcón
Falcon
Raymondville
Laguna Madre
Ciudad Miguel Alemán
Rio Grande City
Marte R Gómez
Alton
Edinburg
Elsa
Ciudad Gustavo Díaz Ordaz
Palmview South
McAllen
Donna
Mercedes
Harlingen
San Benito
Los Fresnos
Port Isabel
Cameron Park
Reynosa
Providencias
Ciudad Río Bravo
Cerralvo
Matamoros
20 mi
20 km
Contributed by

Potential Water Depth (Feet)



“Xena” Potential Flooding from the Sea

your emergency action plan)

Extreme

Potential for Extreme Impact: Extremely dangerous and life-threatening inundation may occur. Aggressive preparations should be made for the threat of catastrophic coastal flood damage from sea water. If realized, coastal cities and towns will be inundated, perhaps entirely. Within mandatory evacuation areas, persons who fail to leave will be swept to their deaths, as will outdoor animals and livestock. Some beaches will be destroyed beyond recognition and new inland cuts will be created. Hundreds of structures will be significantly flooded or washed away. Condominiums and hotels will also be devastated, some to the point of collapse. Damage will be accentuated by considerable floating debris. Extensive damage is expected to marinas, docks, and piers. Numerous small craft will break away from their moorings.

Vehicles left behind within evacuation areas will be swept away. Dozens, if not hundreds, of roads will be overspread or washed away; full recovery will take months, if not years. Sea water many feet in depth may reach more than a mile inland. Flood conditions will be worsened by intense battering waves on top of storm surge and tide. Such waves will exacerbate property damage and wash out solid road and bridge structures. Damage from beach erosion will take years to restore.

Descriptions are consistent with the likelihood for widespread inundation with local water depths greater than 7 feet (above ground level) in hardest hit places. Relative to impact potential, coastal flooding may be historic since there are no recent comparable events which have occurred along or near the coast of the Lower Rio Grande Valley.

High	**Potential for High Impact:** Dangerous and life-threatening inundation may occur. Aggressive preparations should be made for the threat of major coastal flood damage from sea water. If realized, most coastal communities will be inundated, especially if the surge arrives during high tide. People who do not heed evacuation orders may drown. Many shoreline structures of average construction which are not elevated above the waterline will be destroyed; widespread, sometimes devastating personal property damage is likely elsewhere. Moderate to major damage is expected to marinas, docks, and piers. Many small craft will break away from their moorings, especially in unprotected anchorages. Vehicles left behind in evacuated areas will likely be damaged or swept away. Numerous roads will be swamped; some possibly washed away. Entire flood-prone coastal communities may be cutoff for an extended period with sea water several feet deep reaching more than a mile inland. Coastal residents in multi-story facilities also risk being cutoff. Flood conditions will be worsened by battering waves on top of storm surge and tide. Such waves will exacerbate property damage, increasing the potential for destruction of homes and businesses, even those of block construction. Damage from beach erosion could take a year or more to restore. Descriptions are consistent with the likelihood for widespread inundation with local water depths of 5 to 7 feet (above ground level) in hardest hit places. Relative to impact potential, a comparable event in recent history is Hurricane Beulah in 1967.

Aftermath

- Xena Will Weaken to a Category 1 (wind) storm over McAllen
- Storm Surge (seawater) flooding will remain an issue through morning high tide July 30th. **Worst impact since Allen and Beulah.**
- **Inland Flooding may rival Dolly from Harlingen to Laguna Vista**
- **1 million residents will be without power**
- **Recovery will take months in Cameron and Willacy County; SPI will be out of commission until September, at least**
- **We pray everyone prepared or evacuated as ordered.**